TELEPHONE ENGINEER

Volum CXVIII ... AUGUST, 1917 ... Numb 2

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Increasing use of the telephone.

The Result

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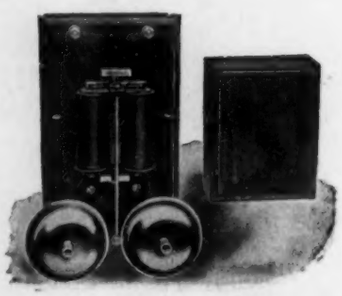

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Business Not as Usual

STATE commission reports show considerable unanimity in granting rate raises to distressed telephone operating companies. Requests for increases are also becoming encouragingly frequent. Some Independent operators, at least, are awakening to the fact that higher rates are necessary if they are to continue efficiently their important function of meeting the nation's demands for service.

The keyword to the situation in the telephone industry (to say nothing of other industries) is "shortage." The condition it indicates runs through pretty nearly everything, from labor and the special materials necessary to coal for heating the exchanges. The shortage of material is particularly acute; and prices for what little is available are, and will be, correspondingly high.

In the emergency—for it really amounts to that—operating companies will find it judicious to continue, and perhaps increase, their advertising and appeals to the public. The cooperation of telephone users is more important now than it is during normal times; and space ordinarily devoted to encouraging free use of the telephone will now yield still better returns if utilized to foster conservation.

Since the telephone company sells only service, and that service consists not in delivering messages but merely in establishing a path for messages, the actual use of the instruments is beyond its control. Modification of existing abuses can come only through appeal and explanation to the public.

The elimination of unnecessary calls, and the curtailing of necessary calls, would bring about a tremendous saving both in labor and equipment. This condition, undesirable at other times, has become temporarily a necessity. A reasonable amount of publicity, showing why it is necessary, and establishing the careful use of the telephone as a patriotic duty, will undoubtedly bring satisfactory results.

The shortage of male labor will be solved to some extent by the use of female labor in lines heretofore handled only by men. Clerical and office positions suggest themselves as the first to meet the change; though the English have found that women proved remarkably efficient even in the more technical branches.

The conservation of materials is no longer a matter of choice; and, forced by circumstances, it will become very embarrassing unless it is met by public conservation of messages. And the same is true of the labor situation. That the condition can and will be adequately met, however, there is no reason to question. The demand is for adaptability on the part of the telephone manager: when that is accomplished the telephone system will be found adaptable enough. Every operator will find that he must adopt a new attitude toward the service users—that of restriction. He must accustom himself to the employment of a new kind of labor—women in men's places. And he must prepare himself for a battle of his own—the fight to prove the necessity of higher rates.

Buying new material can be postponed—"stalled along"—because it has to be. But sooner or later increases must be taken care of, to say nothing of repairs; and that inevitable

time will probably come before the manufacturers are prepared to meet it, and before prices have returned to their former level—if they ever do. Only increased rates will take care of that necessity; and the operator who struggles along on the old rate, hoping that a return to normal business will restore his equilibrium, is likely to be in for a hard time.

Raise your rates!

Central Union

EVER since the Central Union Telephone Company was removed from Bell dictation and placed under receivership, we have called it an independent company. Judge Dever makes it quite clear that it is an independent company, and that if his decision were final it would so remain for the rest of its days.

In the face of the inevitable appeal, too much jubilation might appear like taking for granted the ultimate decision of the higher court. Nevertheless, most independent telephone men (we are using the small "i" advisedly) think they know what the outcome will be, and that the Bell group has lost a member.

Old Independents who read the digest of Judge Dever's opinion, prepared by Cassoday, Butler, Lamb and Foster and presented to our readers a few pages over, will not be surprised at the record it reveals of Bell monopolistic tactics. It is an old story to most of them, much of it coming within their own experience. It is so clearly set forth that our comment can add nothing of importance to it.

The Central Union case has been one of the most interesting in the history of American telephone operating. It will continue to be interesting through its trial in the higher courts and, we believe, in its subsequent career as a member of the Independent group.

The Motor Vehicle Question

MOTOR vehicles of various kinds and sizes have become a necessary part of telephone plant equipment. Some of the larger telephone companies use astonishing numbers of motor driven trucks and runabouts. A few companies have several hundred gasoline vehicles in use, ranging from specially designed five-ton trucks down to light motorcycles.

The possibility of a shortage of gasoline, with consequent high prices and perhaps commandeering of much of the visible supply by the government, offers a possible problem to telephone companies, as it does to other users of motor transportation. In England the use of gasoline, or "petrol," has been forbidden except for government purposes. Before the embargo, prices had reached an almost prohibitive altitude.

While it is unlikely that conditions in this country will go so far as they have gone in gasoline-using Europe, the prepared telephone man will want to give some consideration to the question.

Apparently it has not occurred to telephone men to regard the electric vehicle as a substitute for the gasoline vehicle for their work. The radius of operation of a modern storage battery vehicle is entirely adequate for all the requirements of any local telephone company. For toll line work it is not fitted, but for total daily mileages of sixty or less it is highly efficient. A casual inspection of records will, we are sure, reveal that such a radius of action is sufficient for nearly all work.

In the charging and care of the storage batteries of electric vehicles the telephone man has a peculiar advantage. Every telephone company large enough to take the motor vehicle question seriously is thoroughly familiar with the peculiarities of the secondary cell, and has enjoyed a considerable experience with them. The regular charging apparatus of the exchange will take care of the vehicle battery charging, by the simple expedient of connecting the vehicle cells in multiple to secure the same terminal voltage as the telephone cells.

Electric vehicles are exceedingly simple, reliable and satisfactory. As a reserve solution for possible gasoline difficulties they are worth acquaintance; and this note is intended to serve merely as a reminder of their existence, and of the further fact that electricity will never be commandeered, run short, or reach prohibitive prices.

A Section of U. S. Signal Reserve Corps Receiving Instruction in Engineers' Conference Room, A. T. & T. Co., 195 Broadway, New York. This Section Is in Charge of Capt. W. S. Grant, U. S. A., Assisted by Lieut. C. H. Corlett, U. S. A. Lieut. Col. Carl F. Hartman, U. S. A., Is Signal Officer of the Eastern Department.—Courtesy of "The Telephone Review."

Couldn't Fool Uncle Joe

Shortly after Alexander Graham Bell invented the telephone, "Uncle Joe" Cannon, then a young member of Congress, was approached with a proposition to invest $1,000 in the new project to talk over an ordinary wire strung on top of wooden poles. For $1,000 he was assured he could be in on the ground floor of a great business enterprise that was destined to revolutionize methods of communication the world over.

Just a short time before that Cannon had lost a few hundred dollars in a scheme to convert brass into gold by a new chemical process. So he laughed heartily and slapped his thigh when the telephone proposition was laid before him. "I would much rather," he declared, "put my money in something more conservative. I think I'll go out to the country and buy up a few bee hives."

A few days later Cannon had occasion to call at the office of a young chap named Vail, who was at the head of the railway mail service in the post office department.

"Mr. Vail is not in. He has resigned his place," Mr. Cannon was informed.

"Resigned his place!" exclaimed Cannon, in amazement, for resignations from government jobs were almost unheard of.

"Yes, he's gone with this thing, invented by a man named Bell. You know—they claim they can talk between different towns over a wire. Vail invested some money in it and is going to make that his business."

"Well, it's just too bad," said Cannon. "I always liked Vail. They tried to get me for a sucker. I'm sorry it should have been a nice chap like Vail."

He never saw Vail again until last winter when he attended a big dinner at the National Geographic Society in Washington. The guests all around the table placel receivers to their ears and heard the roar of the Pacific Ocean at San Francisco. Right near Cannon sat Theodore N. Vail, the head of the American Telephone & Telegraph Company.

"Blamed if it ain't a funny little old world!" remarked Cannon.

It is at that.—*Champaign* (Ill.) *Gazette*.

Why Is a "Business Rate?"

It has always puzzled me why a small town telephone company established what is commmonly called a "business" rate, says "W. E. B." in *Toll Line Flashes* of Indiana. The rate question has always been and always will be a spectre to the manager of the small exchange as long as the average farmer doing a business that runs into the hundreds and thousands yearly slips along at the residence rate while the painter or the saw and hatchet carpenter doing a business that barely pays the rent and grocery bill must pay a "business" rate. It may have been the desire of the pioneer village telephone company to do business after the style of the city, but it was a mistake. The business rate of the small town is not too high, but the rural rate is by far too low, and an adjustment should be made along different lines. Measured service may not be practical in rural districts but if some contraption could be placed in the "box" secretly to record telephone calls, some surprises would be in store for the interested company. In the first place most of the so-called business men would be shown to have little or no business at all. It would also be shown that many of the so-called "residence" rate subscribers are doing a big volume of business daily. It is true that a painter may be called to figure on a job, or a plumber be called to repair a leaky pipe, or the grocer may be called to name a price on some commodity, but in most cases the greater benefit is derived by the party calling. The farmer obtains the price to be paid for his produce before he leaves the house. He sells a steer for a hundred dollars, a load of wheat for two hundred, a few eggs for the price of a year's telephone service, and so on ad infinitum. He is a business man and does business over the telephone at a "residence" rate. He calls more times than does the average business man in a small town and does a business of greater net profit than does the average small town business man. Verily, he IS a business man and for the life of me I can not see why he is entitled to more for his money than is the man who runs a little store or paints a few houses a year. It has always been a question in my mind as to where to draw the line to give the business man a square deal and at the same time avoid the appearance of exacting tribute from a man simply because he is unable to own a farm and live in the country. In my mind, no line should be drawn, for if any man in the republic is a business man, the farmer surely is one. To comply with telephone regulations we must draw a line but the average telephone company fails dismally to draw an "equator." The line resembles the meanderings of the wandering Jew as it dodges here and there to catch those who have a name for business if not the business.

More Railway Telephones

J. M. Wilson, owner and manager of the C., B. & C. Railroad stated in Bluffton, Ind., recently that he had purchased wire to install a telephone dispatch system on the line. At the present time the railroad dispatcher gives orders over long distance on the regular county independent lines and conditions, of course, are not as satisfactory as if the company owned its own line, since the dispatcher has to wait on his calls the same as any other customer of the long distance service.

The work of erecting the new dispatch telephone system will be started soon, it is said.

The road is now enjoying a fine increase of business in the freight line. Much coal is being shipped through from lines leading into Chicago and Cincinnati.

In regard to section men on the line, it is reported that there are at least fifteen men employed keeping the roadbed in condition, even though the roadbed does not show the appearance of their work. The C., B. & C. has paid their men good wages of late and there has been no kick coming.

Road Dispatching in Parks

In a description of Messa Verde National Park, the government's Colorado preserve, the Mountain States Monitor says:

"The telephone plays an important part with the traveling conditions of the park. A line has been constructed by the government from Mancos to the ruins, with five stations which are installed at intervals along the road. All visitors, upon entering the park, are required by the park rules to call the superintendent's office on arriving at each station, to ascertain if any vehicles are on the road between that and the following station. It is also required that a stop of three minutes be made at each station. These rules are made necessary on account of the narrowness of the road, and they serve also as a guide for the superintendent's office, enabling him to keep in constant touch with the traffic conditions at all times."

Central Union Divorced from Bell

Judge Dever Orders Big Company Sold—Appeal Taken

Notice of appeal from the decision of Superior Court Judge Dever divorcing the Central Union Telephone Company from the American Telegraph & Telephone Company was filed July 12.

THE Central Union Telephone Company, operating in Illinois outside of Chicago, in Indiana and in Ohio outside of Cleveland and Cincinnati, and deriving a yearly business of $9,600,000 from its 370,000 stations, has been divorced from the American Telegraph and Telephone Company and all stock held in the Central Union Telephone Company by the American Telegraph and Telephone Company has been ordered sold at public auction. Henceforth it will operate as a separate, independent company.

This state of affairs was brought about July 10 by a decree entered by Judge William E. Dever, of the Cook County Superior Court, as a result of the action brought against the Central Union company by William A. Read. The decree is similar to the opinion given in this case by Judge Dever last January. (TELEPHONE ENGINEER, February, 1917.)

The court declared that the Bell system is a monopoly and has been ever since its establishment. The decree orders all of the notes of the Central Union Telephone Company held by the American Telegraph and Telephone Company, amounting to more than $40,000,000, be surrendered and canceled. It holds that all stock holding of the American Telegraph and Telephone Company in the Central Union Telephone Company is illegal and void and orders it sold at auction.

The American Telegraph and Telephone Company and all parties connected with it are prohibited from bidding for or buying in this stock. The court orders an accounting against the American Telegraph and Telephone Company in favor of the Central Union Telephone company for wrongful diversions of business, for unfair treatment in payment of so-called originating commission, for the American Telegraph and Telephone Company's conduct in handling leased wire business, for the diversion of tolls on messages handled jointly by both companies, and for expenses incurred by the Central Union Telephone Company in redeeming $6,000,000 of its matured bonds in 1912 without any proper reason therefor and merely in the interest of the American Telegraph and Telephone Company.

The court holds that the A. T. and T. Company must share with the Central Union Company the losses incurred by the latter through the fight made by it on behalf of the entire Bell system and against the independent telephone companies operating in Illinois, Indiana and Ohio.

The court continues in force the injunction previously granted against the sale of Illinois assets of the Central Union Company to the Chicago Telephone Company, which was to be made according to a plan proposed by B. E. Sunny, president of both companies, at a price which the court finds was unfair to the Central Union Company, and which it was proposed by Mr. Sunny should be followed by the sale of the Indiana and Ohio assets at an aggregate price which would have wiped out the minority stockholders of the Central Union Company altogether.

The court further enjoins the A. T. and T. Company and all of its allied corporations from buying any of the assets of the Central Union Company.

Judge Dever also declares Mr. Sunny and the officers of the A. T. and T. Company, who also were directors of the Central Union Company, were guilty of breach of their fiduciary obligations toward the minority stockholders of the Central Union Company.

The Central Union Company properties have been in the hands of receivers appointed by Judge Dever in this case since January, 1914. The receivers are David R. Forgan, Frank F. Fowle and Edgar S. Bloom.

Judge Dever's decree, including exhibits and maps, fills 340 printed pages.

The defendants were represented by John P. Wilson, Judge Sears, Major Tolman; Holt, Cutting & Sidley and others.

The complainants were represented by the firms of Cassoday, Butler, Lamb and Foster; Stephen A. Foster, Rush C. Butler, Cornelius Synde, Herbert Pope and Beverly B. Vedder having been active in the trial of the case. The following is taken from a summary of the decree prepared by them:

Individual Defendants.—None of the directors or officers of the Union Company owned a share of stock in the Union Company, but each director was the holder of record of ten shares in the Union Company belonging to the American Company. Connections of the officers and directors of the Union Company with other Bell companies.

The Fundamental Plan of the Bell System Illegal from the Beginning.—The fundamental plan of organization adopted by the promoters of the Bell system from the very first called for a central stockholding corporation which should have a stock control in each of the many telephone companies operating throughout the United States for the purpose of securing a countrywide combination of telephone companies under a common and centralized business control. The subsidiary companies have not in fact been operated by their own managements but have been mere agencies created and used by the parent company for the purpose of extending and expanding its telephone business, and the stock of the Central Union Company of the par value of over $5,200,000 held by the American Company was acquired for this illegal purpose of the parent company to suppress competition and to create a monopoly.

Various Ways in Which this Monopoly Purpose Was Carried Out.—The elimination of the Western Union Telegraph Company as a competitor in the telephone field; the organization of the Western Electric Company as the manufacturing department of the Bell system and the exclusive contracts made with it; the organization and promotion of the long distance company and the exclusive privileges granted to it; the extension of the Bell system through the making of sublicensee contracts with small independent companies throughout the country—all evidence the illegal purpose on the part of the parent company to suppress all competition in the telephone business.

Increase in Stock of American Company and Extent of Its Monopoly.—The authorized stock of American Company was increased from time to time to $500,000,000, and the proceeds used to secure for the Bell system as complete a monopoly as possible of the entire telephone business of the United States. The Bell system controls 8,150,000 stations out of 10,000,000 in the country.

Fundamental Patents.—The ownership of fundamental telephone patents did not authorize the parent company to use its rights for the purpose of suppressing competition in violation of the laws of Illinois, and neither did these patents confer upon the parent company the privilege of monopolizing the telephone industry of the country and could not result in fastening upon the public a perpetual monopoly of a service that has become a public necessity.

Perpetual License Contracts.—The purpose of the parent company in making perpetual license contracts and securing stock in the subsidiary companies as a consideration therefor was the carrying out of the aforesaid general plan to obtain for the parent company for all time control over said subsidiary companies and to restrict them in the performance of their public duties and to suppress all competition in the telephone business and to secure for the Bell system as a whole a perpetual monopoly of the telephone business of the United States.

Additional Patents Secured for the Same Purpose.—The parent company has acquired control over a large number of potentially competing patents relating to telephone appliances and equipment and its purpose in so doing was to suppress competition in the telephone business and to build up a monopoly.

Bell System a Combination in Restraint of Trade and Commerce.—The Bell system at all times since its inception has constituted a combination in restraint of trade and commerce, both intrastate and interstate, in violation of the public policy of the State of Illinois and of the United States. All contracts made and arrangements entered into and stock ownerships acquired for the purpose of creating or carrying out said combination are null and void.

Stockholding in Union Company Acquired in Different Ways.—Thirty-five per cent of the stock of the Union Company was originally issued to the Bell Company in consideration of the grant of the license contracts. Further stock was acquired from the Union Company by the Bell Company or the American Company for different considerations, or without giving any consideration.

Further Stock Acquired from Former Stockholders of Union Company.—Breach of Fiduciary Relation.—Large amounts of stock in the Union Company were bought up at the lowest price obtainable "for the protection of the American Company." Officers of the Union Company and officers of the American Company who were also directors of the Union Company were guilty of a breach of the duty they owed to the minority stockholders of the Union Company.

Growth of Union Company's Plant.—The Union Company had already constructed telephone exchanges in most of the towns and cities of its territory and a limited toll system connecting the same before the American Company built its lines into said territory. Transformation of the Union Company's iron grounded circuits into copper metallic circuits was made in 1892.

American Company's Lines.—Construction of the American Company's lines in the Union Company's territory included many which were parallel to the lines of the Union Company.

Competitive Status of the Two Companies.—From its inception the Union Company has sustained a competitive status toward the parent company, and all competition has been suppressed between the companies of the Bell System by a series of contracts and arrangements extending over a long period of years in an intricate and far reaching attempt to monopolize the telephone business of the whole country.

Complete Control Over Union Company's Affairs.—Matters which have an effect upon the Bell System as a whole have been settled by the central administration of the parent company, and one mind, that of the parent company, has dominated the affairs and relations of the subsidiary companies. The board of directors of the Union Company had practically nothing to do in the formation of the policies of the Union Company. The American Company as majority stockholder actually conducted the business of the Union Company, and the latter was only nominally represented in the conduct of its affairs.

Rights of Minority Stockholders Ignored.—Illegality and unfairness of the conduct of the principal officers of the parent company was no doubt the result of imperfect knowledge of the law and a too intense devotion to realization of the illegal purpose of the parent company. Legal rights of minority stockholders of the Union Company were in many important ways lost sight of.

Merger with Other Bell Companies.—The Union Company was, through the action of the American Company, merged for operating purposes with the Chicago, Wisconsin, Michigan and Cleveland companies in the so-called central group of Bell operating companies with headquarters at Chicago, the same individuals being elected officers of each of these five companies and the joint expenses being apportioned among same. The stockholders of the Union Company were not advised or consulted with reference to this matter.

Stockholding of American Company.—Illegal and void; Section 26 of Incorporation Law of Illinois; Inevitable tendency to suppress competition; Illegal purpose.—The stockholding of the American Company in the Union Company is null and void on each of three grounds: (*a*) Because of a lack of power on the part of the American Company—under Section 26 of the General Incorporation Law of Illinois a foreign corporation doing business in Illinois can exercise only such powers as can be exercised by Illinois corporations of like character, and under the decisions of the Supreme Court of this state, an Illinois corporation cannot own stock in another company engaged in the same line of business; (*b*) because the holding of such stock control by the American Company had an inevitable tendency to stifle competition between the Union Company and the American Company and to create a monopoly of the telephone business; (*c*) because this stock control was acquired by the parent company for the illegal purpose of suppressing competition and creating a monopoly.

Sherman Law.—The court does not pass on the question whether the facts as found showed a violation by the American Company of the Sherman Anti-Trust Law.

Public Utility Law of Illinois.—The passage of the Public Utility Law of Illinois which went into effect January 1, 1914, nearly a year after the original bill had been filed in this cause, and long after the stock of the Union Company had been acquired by the American Company, cannot render valid such stockholding of the American Company and did not legalize the control by the American Company over the Union Company, an Illinois competing corporation.

American Company in Position of Fiduciary.—The American Company occupied the position of fiduciary toward minority stockholders of the Union Company in all matters where the American Company dealt with the Union Company.

Territorial Limitations of License Contracts.—Accounting denied.—Provisions of license contracts are illegal so far as they limit or restrain the exercise by the Union Company of its charter powers, but the court finds it impossible to apply a rule for an accounting of the damages, if any, that have accrued to the Union Company by reason of the territorial limitations upon extension of its lines and, therefore, denies an accounting.

Routing Arrangements.—Accounting ordered.—All messages handled jointly over the lines of the Union Company and the American Company were routed pursuant to arrangements enforced by the American Company in such a manner as to give the American Company the longest possible haul, thus reducing the proportion of revenue accruing to the Union Company. Accounting ordered.

One Hundred Mile Contract.—Accounting ordered.—The Union Company has, under provisions of this contract with the American Company, been deprived of business which under judicious management would have been profitable to the Union Company. Accounting ordered.

Originating Commissions.—Accounting ordered.—Originating commissions paid the Union Company on messages originating at its exchanges and transmitted jointly over its lines and the lines of the American Company did not even reimburse the Union Company for cost of operation in year 1912. Viewed in the most favorable light to the American Company, that company and the Union Company were in the position of partners. The American Company's profits were not disclosed. Accounting ordered.

Pro-rates.—Accounting ordered.—A so-called pro-rate was paid the Union Company for the actual toll line haul of joint business over the lines of the Union Company. No evidence was submitted to show profits of the American Company, and accounting is ordered to determine fairness of the pro-rates paid the Union Company.

Pole Line Attachments.—Accounting denied.—The Union Company was not defrauded under the reciprocal arrangement by which 10 cents was paid as rental for each attachment. Accounting denied.

Leased Wire Business.—Accounting ordered.—The American Company as fiduciary is held bound to account as to its conduct in relation to this business.

Four and One-half Per Cent and License Contracts Cover Rental of Instruments Only.—Payments excessive as rental.—The payments provided for in the 4½ per cent and license contracts are for the use of instruments and nothing else, and prior to 1910 there is nothing in the contracts themselves or in the correspondence to indicate that the American Company or its predecessor the Bell Company ever demanded or thought of charging compensation for the above mentioned services as part consideration of the 4½ per cent payments. The payments made were excessive considered as payments for the use of telephone instruments only.

General Staff of American Company.—The general staff of the American Company consists in part of an engineering department which is largely engaged in inventive, experimental and development work in the interest of not only the American Company, but of the whole Bell organization, including the different subsidiary companies. Assuming its legality the court is im-

pressed with the soundness of the economic principles embodied in the theory of the defendants in this matter.

Four and One-half Per Cent Payments, if Treated as Covering Services, Not Excessive.—Accounting denied.—Disregarding the form of the so-called 4½ per cent contract and of the original license contracts, the Union Company in this equitable proceeding is bound to pay for the engineering, accounting, etc., services rendered by the American Company. No evidence is in the record from which the actual value of these services can be determined, but there is no doubt in the mind of the court that the value of such services was as great, if not greater, than the excess charged to the Union Company for the rental of telephone instruments.

Western Electric Purchases.—Accounting denied.—The Union Company's supplies for many years were purchased exclusively from or through the Western Electric Company. Profits of the Western Electric Company in some of these matters were large, but taking the business as a whole it is far from clear that these contracts were, in fact, fraudulent or that they were even unwise; the evidence presented is intricate and involves the consideration of a mass of testimony relating to technical matters of accounting and manufacturing; the evidence is sufficiently full to enable the court to say that no fraud appears and the court finds that no further accounting should be ordered.

Alleged Indebtedness to American Company.—Loans made by it ultra vires.—The American Company has no express or implied power to conduct the business of loaning money, and the making of loans by the American Company was *ultra vires* the American Company and against the law and public policy of the State of Illinois. Any notes held by the American Company representing said loans cannot be enforced as notes against the Union Company; the American Company can recover only on basis of benefits to the Union Company, and so far as said loans were advanced to the Union Company as a joint enterprise an apportionment should be made as to the amount which should be charged to each of said parties.

Fight Against Competition.—Cost should be apportioned.—The whole burden of the fight against competition on the part of independent telephone companies in the Union Company's territory has been borne by the Union Company, but has inured to the benefit of the Bell system as a whole; the loss incurred by the Union Company by reason of rate cutting should be borne by the American Company to the extent to which it benefited thereby.

Physical Connection.—Benefit of American Company.—The American Company could not have conducted its business at all in the Union Company's territory without the sations of the Union Company, and the American Company was benefited by every extension or improvement in the plant and business of the Union Company. The Union Company was treated merely as auxiliary or feeder to the American Company's lines.

Books of Union Company.—Books and records of the Union Company were at all times kept under the direction of the parent company.

Interest.—Legal rate allowed.—Interest on loans made to the Union Company were fixed by the American Company at different rates and in disregard of terms of notes. Court orders interest reckoned on accounting at five per cent per annum.

Unauthorized Notes of Union Company.—Of the notes for nearly $33,000,000.00 outstanding at the time the bill was filed, less than $6,000,000.00 had been authorized by the directors, and less than $12,000,000.00 by the Executive Committee. The American Company took with full notice of such lack of authorization.

1910 *Plan of Reorganization.*—Under this plan the American Company was to convert $15,000,000.00 of its indebtedness into stock of the Union Company at par. For some reason not appearing in the evidence, it was never carried out.

1913 *Plan.*—Plan to sell out all the assets of the Union Company to the Chicago Company and other corporations controlled by the American Company. Promised written assurance of postponement of special meeting of stockholders called for February 11, 1913, not given complainants, and bill filed February 8, 1913. Injunction granted against carrying out the sale, which as planned by President Sunny would have eliminated the minority stockholders of the Union Company altogether and made their stock worthless; President Sunny urged that the property of the Union Company be sold for a lower price than the representatives of the American Company thought should be paid for it; on the date of the meeting of the stockholders of the Chicago Company the proposed purchaser of the Illinois assets of the Union Company which was four days after the granting of the temporary injunction issued by the court, the plan of selling the assets of the Union Company in Illinois to the Chicago Company had not been abandoned, but its execution had merely been postponed.

Bethell's Intention to Interpose.—The court finds that Vice President Bethell of the American Company intended to interpose for the purpose of protecting at least some of the Union Company's minority stockholders from a sale which would have rendered their stock worthless, but no such purpose on the part of Bethell was communicated to the complainants prior to the filing of the bill of complaint and the granting of the injunction.

Bond Redemption.—Accounting Ordered.—The Union Company incurred a loss of over $300,000.00 in redeeming its unmatured bonds and converting same into demand notes given the American Company for $6,000,000.00 and bearing a higher rate of interest. This was imposed upon the Union Company by its own officials acting in the interest of the parent company, and an accounting thereof is ordered.

Injunction and Receivership.—Injunctions granted by this court forbidding all payments to the American Company, and subsequent appointment of receivers *pendente lite*, January 31, 1914.

Laches.—Complainants not barred by.—Complainants had but little, if any, information concerning intercorporate contracts and relations complained of and are not chargeable with knowledge of the illegal and unfair character thereof; as the stock ownership of the American Company in the Union Company had an inevitable tendency to stifle competition and to create a monopoly of the telephone business, this defense of laches or acquiescence can avail the defendants nothing.

Complainants' Conduct of Litigation.—Complainants have performed services of value for the Union Company and been successful in securing relief.

Futility of any Demands on Officers of Union Company.—It is conceded by defendants that any demand by complainants on officers of the Union Company to institute any proceedings against the American Company or to conduct any action that would protect or conserve the interests of the stockholders of the Union Company against the American Company would have been of no avail.

RELIEF GRANTED

All temporary injunctions heretofore granted are continued.

The receivership is continued in full force pending appeal or further orders.

Sale of the assets of the Union Company is enjoined; directors and officers are enjoined from acting as such; stockholders' meeting are enjoined.

The American Company is permanently enjoined from voting any stock in the Union Company or collecting dividends or exercising any control over the affairs of the Union Company. Its stockholding has been at all times null and void.

All stock held by or for the American Company is ordered surrendered for sale, and the American Company and all other defendants enjoined from purchasing the same. The American Company is to be reimbursed out of the proceeds of the sale for what it paid for the stock and the balance is to be turned over to the former stockholders or to the Union Company.

All notes of the Union Company held by the American Company are ordered surrendered for cancellation.

Detailed instructions are issued to the master for the taking of the accounting.

Determination of the rights of the defendant under its cross-bill is postponed.

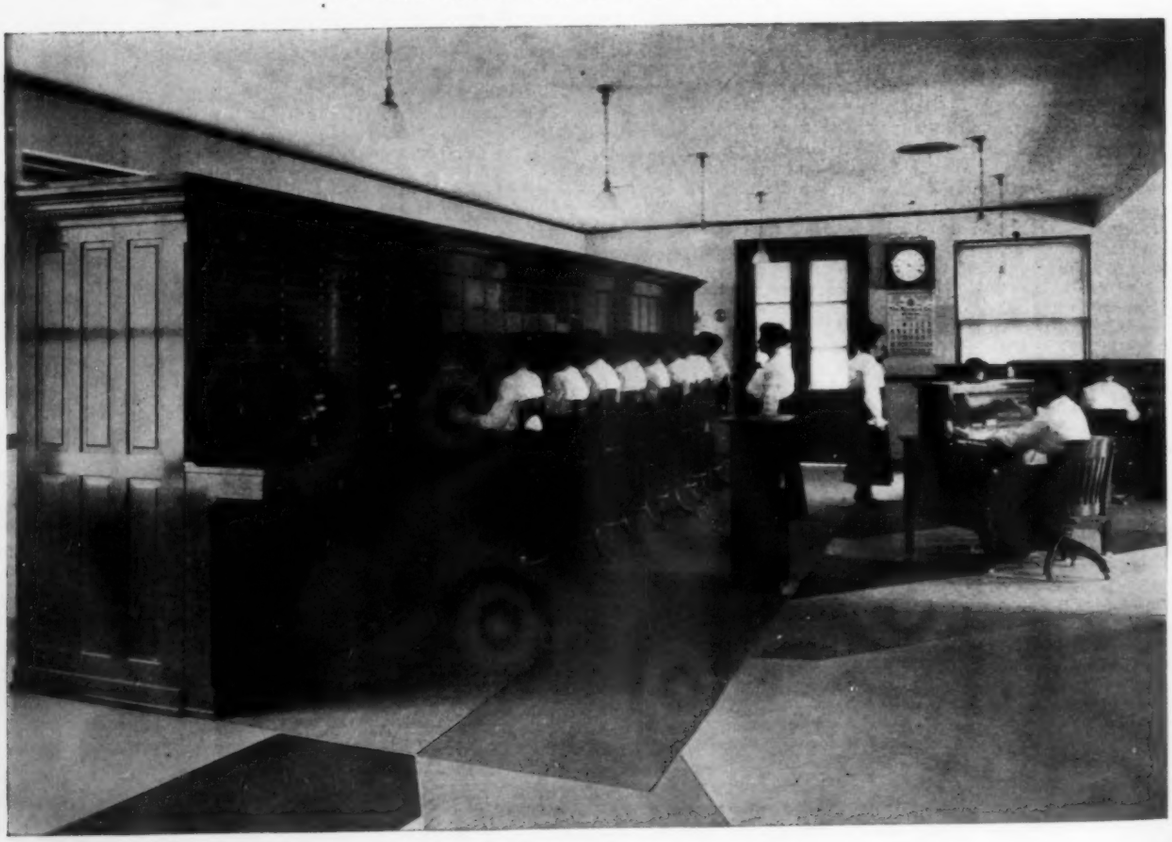
Complainants are entitled to be reimbursed for expenses and solicitors' fees that have heretofore resulted or many hereafter result in benefit to the Union Company, such expenses to constitute a first lien on all funds saved to or recovered by the Union Company as a result of this litigation.

Equipment at Camp Dix

There is no doubt that the army officers at Camp Dix in New Jersey will have first class telephone service. The camp is to have a nine-position switchboard to take care of several hundred telephones. Through the Trenton exchange there will be direct connection with Washington, New York and Philadelphia for official communications, and most all of the long distance service will go through that exchange, but Philadelphia local and other near-by calls to the westward will go through the Mount Holly exchange, which now has extra service over seven new trunk lines opened between it and Philadelphia.

To take proper care of the Wrightstown business, an expert instructress has been placed in charge of the operators at Mount Holly, and there is also a new traffic man on the job. The camp central plant is located near the center of the site, but it will shortly be placed within a short distance of Wrightstown.

The Central Office Building, Dixon Home Telephone Company



The Main Switchboard

The Dixon Home Telephone Company

The Story of One of Illinois Most Progressive Independents

A history and description of any progressive telephone company are always intensely interesting, and furnish an inspiration for other companies which, while operating under similar conditions, may not yet have taken the steps toward improvement that are noted in this story. In publishing it we are paying tribute not only to the Dixon Home Telephone Company, but to the exquisite booklet on the subject prepared by the Stromberg-Carlson Telephone Manufacturing Company, from which this material is taken.

THE Dixon Home Telephone Company of Dixon, Illinois, is an outgrowth of the Lee County Telephone Company, which was organized by L. D. Pitcher in 1896, this being the first company to furnish telephone service throughout Lee country.

Upon the organization of the successor company in 1904 the interests of the Lee County Telephone Company, outside of the city of Dixon and the adjacent rural section, were disposed of and the Dixon telephone system entirely rebuilt. At this time a new Stromberg-Carlson central office equipment was installed. The re-constructed exchange operated in competition with the Central Union Telephone Company until 1912 when the local "Bell" exchange was purchased, dismantled and the operation of the long distance lines taken over.

On January 15, 1916, the exchange building was swept by fire and all the central office equipment and records were destroyed. Notwithstanding this serious handicap the operation of the system was resumed in temporary quarters with emergency equipment thirteen days after the fire. The permanent installation of a new and thoroughly modern Stromberg-Carlson central exchange equipment has now been completed and is giving service to more than 2,500 subscribers in Dixon and the outlying rural district. The popularity of the service is evidenced by the fact that there is one telephone to every four persons in Dixon.

The organization of the Dixon Home Telephone Company is headed by President J. C. Flowers, who is also president and general manager of the Premier Motor Corporation of Indianapolis. The vice-president is E. N. Howell, of the E. N. Howell Hardware Company of Dixon. C. B. Cheadle is secretary and also holds the same office in fourteen other telephone companies in Illinois and Iowa. W. C. Durkes, president of the City National Bank of Dixon, is treasurer. Louis Pitcher is managing director and has been connected with the company and its predecessor for twenty years.

THE NEW CENTRAL OFFICE BUILDING

The new building, which is conceded by telephone men throughout the country to be one of the finest of its kind, was designed by N. Max Dunning, of Chicago, one of the leading architects of the middle west. It has an exterior of rough faced brick shading from red to a dark brown with buff-colored mortar joints and dark red terra-cotta trimming. The building is thoroughly fireproof throughout, no wood except the trim having been used in its construction. The floors in the vestibule and public office are of tile and those in the remainder of the building are of concrete with a special floor treatment.

The public entrance of the building is on the ground floor opening into a small lobby from which stairs lead up to the public offices on the main floor where a bank rail separates the office from the public space. The directors' room and manager's office open directly off the public space. A stenographers' room adjoins the manager's office. The woodwork in the offices is solid mahogany, while in the remainder of the building is red birch with mahogany finish.

On the main floor there are two folding door telephone booths for long-distance service and two others on the ground floor for public pay-station service at night when the commercial offices are closed. Iron grille doors prevent access to the commercial offices at such times at the same time removing the privacy which ordinary doors would give to prevent loitering. The employes' entrance at the side of the building enables the employes of the commercial, traffic and line departments to enter or leave their quarters without going through any of the other departments.

The second floor of the building is used exclusively for the traffic department. On this floor are located the operating room, locker room and a large club room for the operators. The club room includes a kitchenette fully equipped with dishes, a gas stove and all necessary cooking utensils, so that warm lunches may be served. Folding tables and chairs are furnished to accommodate a party of thirty persons. The lavatory on this floor is finished in white marble and includes shower bath for the use of the operators.

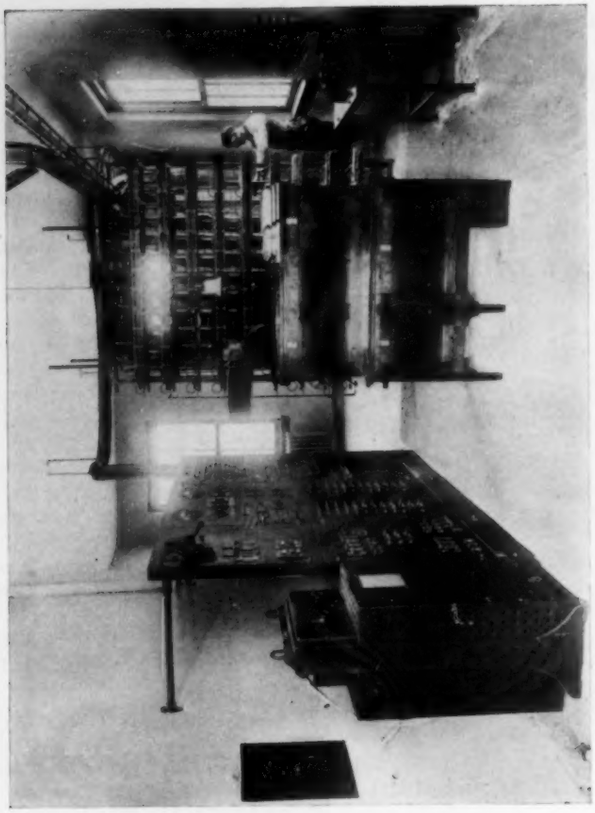
A garage at the rear of the building accommodates the company's auto-truck, troubleman's roadster and motor-cycle. The basement which is entered either from the garage or the front vestibule contains the supply rooms, battery room, cable tunnel and Dunham vapor heating plant. The heating system is electrically controlled by a thermostat in the operating room so that an even temperature is maintained day and night.

THE EXCHANGE EQUIPMENT

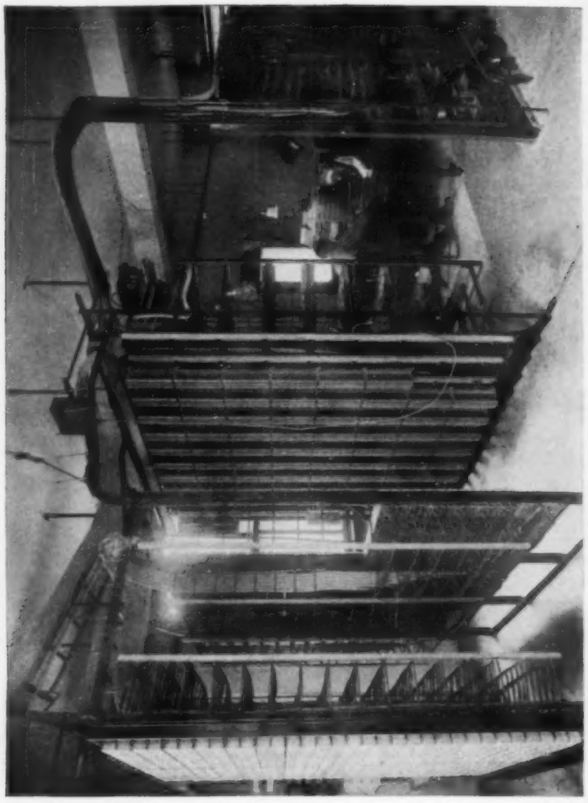
The local subscribers' lines are interconnected upon a Stromberg-Carlson central energy lamp signal multiple switchboard which includes every modern feature of proven value. It is equipped for present requirements to serve 1,400 lines, but is designed so that the capacity can be easily increased to 4,800 lines as the growth of the system demands.

When a subscriber lifts the receiver of his telephone from the hook when making a call the action causes the illumination of two small incandescent lamp signals on the switchboard, one of which is directly in front of the subscriber's operator and the other in a concentrated lamp multiple. This is arranged so that any one of three operators can answer the call and it has been found that over thirty-five per cent of the calls during the busiest hours are answered under the team-work plan. In other words thirty-five per cent of the calls are answered with greater speed than would be possible if this improvement had not been added.

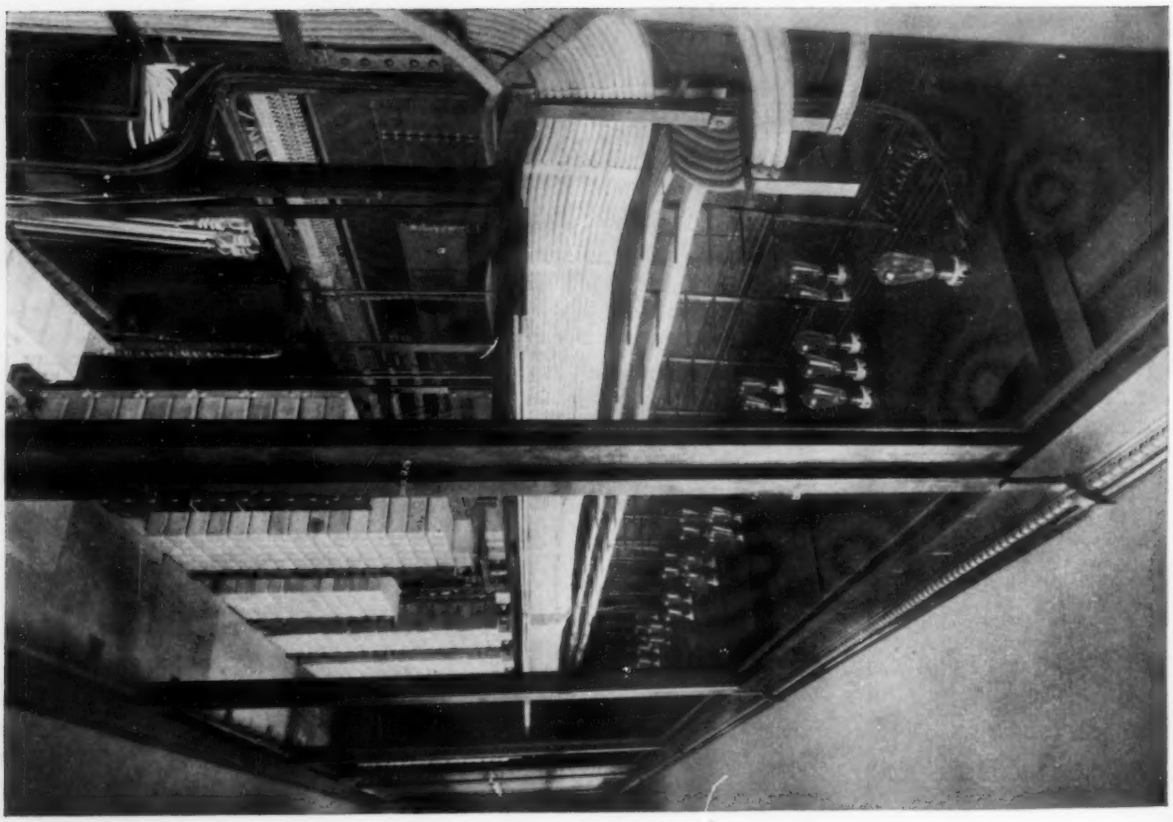
The connection between any two separate lines is made by means of a pair of flexible cords terminating in plugs designed to fit the terminal jacks of the lines with great accuracy. Each operator has seventeen pairs of cords before her with which she makes the connections



Power Control Switchboard



Terminal Frames and Cable Racks



Rear View of Main Switchboard
Operating Room of the Dixon Home Telephone Company,
Dixon, Illinois

The Toll Switchboard

Lobby—Booths. Stenographer's Office
Main and Auxilliary Storage Battery

Kitchenette
Operators' Lockers

Rear View of Main Switchboard
Operating Room of the Dixon Home Telephone Company,
Dixon, Illinois

Terminal Frames and Cable Racks

tor the subscribers whose lines terminate in her position. The circuits of these connecting cord pair equipments include a number of the latest improvements in telephone switchboard manufacture which are designed to increase the speed and accuracy of the service by lessening the work required on the part of the operator in handling each call.

To answer a call the operator picks up the answering plug of the cord pair selected and inserts it in the terminal jack of the calling line which is directly over the associated line lamp signal. This action automatically connects her talking set to that cord circuit and provides a talking connection with the subscriber.

After ascertaining the desired number the operator takes the calling plug of the cord pair used and touches its tip to the called subscriber's line jack. If the line is busy she hears a distinctive click which warns her that others are using the line. If the line is disengaged she inserts the plug in the jack. This action automatically disconnects her talking set from the line and prevents any subsequent listening to the conversation between the connected parties.

The insertion of the calling plug in the jack also starts the automatic ringing attachment which rings the called subscriber's bell intermittently and at regular intervals, without further attention from the operator. The ringing is stopped immediately when the called subscriber lifts his receiver to answer the call or when the party calling fails to get a response and hangs up his receiver. During the interval when the subscriber's bell is ringing the calling party hears a distinctive ringing tone which indicates that his wants have been properly attended to.

Another excellent feature which is incorporated in the new switchboard is the flashing recall system. This is for the convenience of subscribers desiring to make successive calls rapidly and eliminates the "wiggling" of the hookswitch to regain the attention of the operator after finishing a conversation with another subscriber. To operate the flashing recall the switchhook is pressed down but once after talking. This causes one of the red cord circuit supervisory lamps to flash rapidly until the operator again answers. It is only necessary for the subscriber to wait a moment as the signal is a prominent one and cannot fail to compel immediate attention.

Each operator's position is equipped with electrically operated counters which automatically register every incoming call answered in that position on meters which are located on the manager's desk. These meters show at a glance the exact number of calls handled by each operator and enables the management to distribute the work of the operators equally, thereby giving all subscribers uniformly good service. To further assist in the supervision of the operating force each operator's position is equipped with pilot lamps visible to the chief operator which indicate the time taken to answer calls and to effect disconnections; multiples of these pilot lamps also appear on the manager's desk.

All toll and long distance calls for points on both the Independent and Bell lines are handled on a separate toll switchboard which is also located in the operating room. This switchboard is of the lamp signal type and is equipped with every device that will improve the quality of the company's service. It resembles the main board in appearance but is somewhat lower since no multiple jack space is required and has deeper keyshelves to provide more writing space for making out message tickets. It is provided with pigeon holes for tickets and book stalls for route and tariff books. Calculagraphs which accurately record the beginning and ending of conversations and automatically calculate the elapsed time are used for basing all toll and long distance service charges and to prevent errors and disputed tickets.

The responsibility for the proper operation of all lines and apparatus rests upon the wire chief, whose office is located on the ground floor in the terminal room. His desk is provided with a complete testing equipment whereby he is able to determine the nature and approximate location of any fault in either the lines or apparatus.

All lines enter the exchange through lead-covered underground cables and terminate on terminal racks which include the lightning arrester and fuse equipment which protects the switchboard apparatus from damage resulting from lightning near the lines or from accidental contact between telephone and power lines. The frames also provide a systematic and conveniently accessible point of junction between the street cables and the switchboard cables.

The exchange power plant includes a storage battery which furnishes all power for talking and signaling purposes. It has a reserve capacity sufficient to operate the exchange continuously for 72 hours with all outside sources of power cut off. In addition to the main storage battery there are two smaller sets of batteries which are used for toll and long distance connections, for which a higher voltage is required. The batteries are charged by means of a mercury arc rectifier and are controlled by a power switchboard which contains all of the necessary switches, meters and fuses.

The equipment of the manager's office consists of a duplicate set of all pilot lamps on the main switchboard so that the manager can observe the quality of the service at all times, likewise message registers which meter the calls in each position. Observation lines lead from the manager's desk to all operators' talking sets so that the work of any of the operators can be closely supervised, when necessary, for the good of the service and the greater satisfaction of all subscribers.

Rockford's Camp Is Wired

Communication, one of the vital necessities in construction and government of Rockford's army city, will be perfected with the installation of six hundred telephones to be in service throughout this Illinois cantonment. Announcement was made by officials of the Central Union that fifty pairs of 19 gauge cables are being rushed into service and that a six section switchboard will be maintained to give army forces the best service obtainable. Ten men will operate the switchboard and there will be no "kidding the operator."

Present construction plans include the erection of a separate communication building to house all telephone and telegraph equipment and offices near the center of camp. At present instruments and switchboard are located in the administration building.

Guard regulations and the protective system both during the construction period and when cantonment is established, will require careful attention to the telephone maintenance. At present instruments scattered through general offices, in headquarters of Company A and Company M and in the sentry box on the Kishwaukee road are used by camp patrols to keep in direct touch with officers of the guard. A general order concerning guard regulations will be issued from headquarters today outlining the extent of civilian freedom permissable in camp. It is planned to extend every courtesy possible to visitors and make restrictions only absolutely necessary to protect the valuable property.

The Telephone and Social Reconstruction

Paper Read Before the Telephonists' Society of the General Post Office London, England

BY JOHN LEE

THE air is filled with ideas of social reconstruction. We are looking, I hope not in vain, for the time when everyone will have the opportunity for a fuller and freer life. The prophets of the Victorian age, Carlyle and Ruskin, warned us of the horrors of the industrial epoch; they told us that industry and materialism had blackened the sky and narrowed our souls. Now it seems as if industry were to be the evangel. More and more steel is to be produced in the furnaces; more and more railways are to be built; more and more telephones are to be laid; more and more factories are to turn out more and more industrial products. And the new heavens are to be opened, and the lion-manufacturer is to lie down with the lamb-worker and there will be no more conflict.

I am not skeptical; I am afraid, rather. I wish I could see the millennium. I have my fears, though, that individualism, though out of favor as a theory, will still remain as a ghost at our corporate banquet. The building of Jerusalem in England's fair and pleasant land is a slow process. But it is in building. There will, I fear, be disappointments. Yet I think we can see that industry is exercising some influence for good and among them some influences on the inner life of our time. For it is that inner life which matters. The outer life of barter and building and bluster is of small consequence in relation with the quiet realm of the spirit. And there, in that intimate chamber, we are learning something and learning it from the industry which was scorned by Ruskin and screeched at by Carlyle. All manner of apparently materialistic industries are exercising their influence. The cathedral of the future will be built of reinforced concrete and will be completed in a fortnight; the cinematograph of the future will reproduce every event for us, with the appropriate acoustic effects, rendering the brilliance of journalism dull by comparison; the intimate communication of the future will be the telephone; and herein lies my claim. Unseen and unappreciated the telephone is exercising and will exercise a vast influence on the rapidly developing life around us.

THE GREAT LEVELER

It is best to look on the telephone switchboard as a photographic visualization of the world at large, but a photographic visualization which has been transformed by a kindly hand much as the portraits which we see in photographic shops have been improved but still retain something of their original resemblance to the person photographed. The world outside consists of all manner of people, duchesses, green-grocers, members of parliament, and dentists. All these varied social grades and many others are represented in our little inner world by lamps. There is no special lamp surrounded by gilt to represent the duchess. There is no special indication, green or otherwise, to represent the vegetable merchant. True, the Traffic Section has invented a mysterious code to indicate differences of payment, and, I understand, differences of service rendered. But this has nothing to do with the social code. The duchess who has a telephone on the measured service has precisely the same lamp as the milkman with a measured service telephone who makes love to her parlor maid. The flat-rate member of parliament —a juxtaposition of attribute which sounds odd—has exactly the same lamp as the flat-rate newspaper proprietor, though everybody knows that the member of parliament is merely a pawn in the hands of the Napoleon of newspaper proprietors.

Looking at our switchboards, therefore, we are looking at a democratic microcosmos. Here, in Bentham's phrase, "Everybody counts for one and nobody for more than one"; and here, too, is a perfect picture of what the world ought to be. It puts everybody in his or her place. No one can choose his position on the switchboard, his telephone number, or the kind of lamp with which he is adorned, but in one tremendous leveling process humanity is redeemed from the social narrowness which give the suburbs their main subject of conversation. There was a conversation recently over a dinner table in the house of a dean, and that conversation surrounded the subject of what constitutes a perfect novel. Someone suggested that in a perfect novel there should be characters whom one would like to meet in real life, and the company proceeded to consider how they would like to meet Becky Sharp, Mr. Britling, and ultimately Sam Weller. "No," said Mrs. Dean, "we could hardly meet Sam Weller; you see we should not be on an equality." Now, thanks to the telephone switchboard, there is one place where Mrs. Dean and Sam Weller can meet on an equality. They may not desire to speak to each other—that would be Mrs. Dean's fault and not Mr. Weller's. Whether they wish to speak or not they are in a position to communicate, they are perfectly equal in telephonic social rank and the greatest joy of all is that the operator speaking to either of them uses the same standard expression in both cases.

THE BINDING LINK

Thus I would commit the social forces of the world to telephonic treatment. I lay on one side, as not worthy of considering, those blind people who say that one ought not to have a telephone. I read the other day an article by a lady in the *Fortnightly Review* which went on as follows:

> The telephone should be among renunciations, even though the contract stands the instrument should not, for it is a perpetual lure to luxury, to idleness, and to entertainment, and we seldom hesitate to use it for the mere gossip purpose, even at its increased toll.

Now let us look at this assault on the telephone. Apparently the good lady imagines that all that the telephone is to be used for is for the broadly unpoetical work of ordering her green-groceries, or beef, or asking a man to mend a trap. She shuts of with a ruthless hand all those most beautiful things in life such as what she calls "idle gossip," the interchange of pleasant thoughts, the communion of fellowship in ideas, and these she calls "idleness." Horrible to say, she proceeds to call them "luxuries," whereas, if there is anything that is necessary to us human beings, it is surely that exquisite and beautiful "gossip purpose" which makes the telephone the binding link in that sphere of mind and soul which separates us from the animal world. Her article would seem to indicate that horses and asses might find the telephone useful for ordering hay or a blacksmith. But human beings, whose wants are so much wider, to whom the world of intellect and the tender world of soul have some meaning, must be limited in their use of the tele-

phone to what corresponds to ordering hay or the use of the blacksmith.

In its work of social reorganization the telephone will not supply those bare necessities of which we hear so much. It will regard civilization as the embroidery of life. It will not say "let us go back to the middle ages and have rushes on our floors, for rushes are all we need, and let us eschew carpets, and rugs, and the warmth of the fire, and the pleasantness of books, and the sweetness of music." On the contrary, the telephone will tend to lay a new emphasis on what we have previously regarded as luxuries. There has been some fore-shortening of the picture as the result of the war, but we are not always going to be at war, we are not always going to live those lives which are narrowed into the sense of living on absolute necessities, food and raiment and a wooden chair to sit on, and drinking people's healths at the parish pump. Sooner or later we shall come to that clear vision of things in which the luxury of these tragic years will become a normal necessity, and in that transfusion of thought the telephone will play a big part.

STANDARDIZED EXPRESSIONS

Thus as we have reduced our telephone subscribers, whatever their social rank, to a general level on the switchboard, it is interesting to observe how in other ways we have affected their methods of intercourse.

To begin with, there is our system of standardized expressions. I am quite prepared to be told that standardized expressions crib and confine one's liberty. It must often be a temptation to an operator to say something different from that which is laid down. I confess that in such a matter as this my natural instincts would lead me in the direction of rebellion. The system would remind me of what Mr. Galsworthy said in "Fraternity";

> Like flies caught among the impalpable and smoky threads of cobwebs, so men struggle in the webs of their own natures, giving here a start, there a pitiful small jerking, long sustained, and falling into stillness. Enmeshed they were born, enmeshed they die, fighting according to their strength to the end; to fight in the hope of freedom, their joy; to die, not knowing they are beaten, their reward.

CONVENTIONAL LANGUAGE

But still on cold consideration there is a good deal to be said for standardized expressions, not only in respect of their value in telephone work, but in respect of their influence on social life. Conventional language is largely made up of standardized expressions, but they have grown loosely and without scientific direction. We say "Good morning" and we say "Good evening"; we also say "So long," "By-by," and punctilious people say "Au revoir" today, and used to say "Auf Wiedersehen" yesterday. I know a rector, an exceptionally lovable rector, who bids good-by to his choir boys by saying "Nightie-nightie," a phrase which seems to me quite suitable for boys in surplices. All these more or less are standardized expressions.

The dramatic critic of the *Times* the other day protested against a standardized expression. It seems that the lady said to the butler, "That will do, James," and the butler left the room. This is an example of a standardized expression which has crept into stage practice, though I gather from the criticism that it is unknown in real life.

It would be infinitely better if an imperial traffic section drew up a code of standardized expressions for greetings, good-byes, commiserations, congratulations, and all the other little intercourses of life. It might indeed go farther.

I confess I should like to see standardized expressions in the modern novels which I have to read for the good of my soul, my mind being temporarily unoccupied. Love scenes in the novels of today have drifted away from the long orations of the Victorian epoch, and have become slangy by-products of conversation, as if a man asked a woman to marry him in the intervals of thinking about tariff reform or the overthrow of the cabinet system.

There are some standardized expressions which may be found in guides to letter writing. I came across such a book the other day, and in it there was an admirable letter suggested for use by a lady declining the hand of a missionary on the West Coast of Africa, and this was the critical phrase: "Although holding for you the highest esteem, and even affection, and recognizing the honor which you have done me, I fear that the climate in (here insert place) will not suit my health, as I am suffering from (here insert asthma, bronchitis, etc.)" It reminds me of the form which people fill up when complaining of loss or delay to a telegram, one line of which says "nature of complaint," and the answer frequently is "rheumatism."

ECONOMY OF WORDS

It is true that standardized expressions are used strictly for economy of words. That will be evident to anyone who looks at such a phrase as "sorry to keep you waiting." I heard a subscriber once say that an operator using this expression did not sound exactly repentant, and I can believe him.

In real life we can convey meanings other than those of the words which we use. A lady in an omnibus, on whose dainty toes a conductor has unhappily trodden, can use "Thank you" with unmistakable meaning. The central object of the standardized expressions is to express appropriately and directly and without embroideries those feelings which we *ought* to feel and not those feelings which we *do* feel. Now if we all felt in life those feelings which we ought to feel and gave expression to them accurately and precisely, instead of those feelings which we do feel at the moment, life would be revolutionized for the better, novels would be impossible, and the theater would have to be given up to acrobats, all of which would be obviously social reconstruction. "What did she say?" we read in Jane Austen's "Emma," and then comes the reply, "Just what she ought to say; a lady always does."

"NUMBER, PLEASE"

Take our most familiar standardized phrase, "Number, please." This is most meaningful. The operator says that she and the whole organism are ready to connect that subscriber to any number in the United Kingdom or at the moment a portion of France; she places at the subscriber's disposal millions of pounds' worth of plant merely awaiting for him to express his demand. Then she adds the word "please," hoping that the service which she is about to render will please him (or that he will write to the secretary), placing herself as *servus servorum populi*.

What the subscriber sometimes understands by "Number, please," fired at him, I understand, in 3.7 seconds, is very difficult to state. Sometimes he is so dizzy by the amazing promptness of the reply that he forgets what he wanted.

One of our colleagues tells a story of a Dublin subscriber who said that "Number, please" said so hastily always frightened him into giving his own number. "I wish," he said, "they would say 'Good Morning. Is there anything we can do for you today?'" The truth is, of course, that that is exactly what they do say; they abbreviate it to "Number, please," but it contains in its impli-

cations all sorts of affectionate offers of help and service. This interpretation of the inner meaning of standardized expressions opens the way to a somewhat pleasing conjecture.

In the romantic ventures of life where it is commonly understood that freedom of expression is necessary I understand that the phrase, "No—but I will be a sister to you," obtained some currency in the Victorian epoch. It has fallen into desuetude, not because a standard phrase for that perfectly delightful situation is not needed, but because being a sister is a little out of fashion. She is now a "pal" or an "old thing" or a "good fellow," and there again you see the influence of standardization. I am not aware in what phrases refusals of offers of marriage are conveyed nowadays; perhaps some ladies will enlighten us, out of their experience, in the discussion which will follow, and if anything can be done in the way of standardization the Traffic Section, with the guidance of your president, will take it in hand.

EXCEPTIONS TO STANDARDIZED EXPRESSIONS

It is said that in a town in New Jersey the telephone administration had determined to carry out the giving of information on a wide scale. One day a subscriber rang up and said to the operator: "There is a funeral going by. Who is dead?" The question, I believe, was aptly answered, but it would be difficult to have done it with the standardized expression. Similarly, there was a curious experience in Chicago. It seems that a lady living in a flat rang up the operator and said, "I am going to visit Mrs. Parker, at Western 1736, and I am going to leave my telephone receiver off. Will you ring me up if the baby cries?" Now it would baffle the ingenuity of any traffic section to formulate a standardized expression for that incident, but it shows the telephone in a pleasantly familiar, not to say domesticated, light.

So we are reaching something in the way of conclusion. For the ordinary things of life, the unconsidered trifles, we invent standardized expressions, a kind of paper currency to avoid the use of gold, but for the real things, babies and funerals, and all aspects of romance, we do not attempt to make standardized expressions. For the more sacred things we have our secret methods of expression like the slave of the Midas who whispered his secrets to the reeds by the river. We are reducing the humdrum to further humdrum. We are lifting the exceptional to the loftiest heights of the exceptional, and no more beneficent influence can be exercised upon a public whose mentality and outlook is changing so rapidly.

INDIVIDUALITY

Professor Royce, of Harvard, was once traveling in a tram-car, and the conductor gave him what in America is called a "transfer" ticket. On it was printed this advertisement: "Individuality sets you apart from all other persons who might possibly be just like you. The average woman feels that she might as well be dead as to be out of the fashion. She wants to wear what everybody else wears, but it must be with a difference."

There is the perfect defense of standardized expressions. The expressions are alike; they stunt individuality. But they are to be used with a difference, that exquisite difference which reveals individuality, that subtle expressiveness by which the true lady can say "Number, please," with an almost affectionate intimate suggestion of friendliness, while someone else—a male, for instance; can use it with the bludgeoning of an ultimatum. It is just as Mr. R. H. Hutton said in his essay on George Eliot: "They have a familiar world of manners to paint, in which a modulation, an omission, or an emphasis here and there, are quite sufficient to make a character or indicate a real emotion." The standardized expression can so be used as to make a character or indicate a real emotion.

INFLUENCE OF EXAMPLE

I have often been puzzled by the standardized words used in the analogical repetition of telegrams. I remember a case in Liverpool years ago where a subscriber, who had not the sweetest of tempers, dictated a telegram in a particularly rasping, irritating voice, with the accompaniment of certain comments. The operator in reply chose words of her own for analogy, and I remember she repeated "and" by A for Ass, N for Noodle, D for Donkey. I understand she was punished, but I never felt quite happy about it, and I hope in the other sphere to which she has gone (she has married well, as we used to say), she will be suitably rewarded and find no further occasion for using the same analogical words. This, however, is a side issue, though it leads us to the consideration of the improvement in enunciation, in the slight emphasis of consonants, and the greater clearness of vocalization which we are teaching the public gradually.

That a minister of religion should announce a hymn as eight-double-five is of small importance compared with the fact that he pronounced the word "five" so that it could not be mistaken for "nine," and the congregation which rejoiced in the improvement of his elocutionary gift did not quite realize that they owed the treasure entirely to the example of telephone operators.

Nor am I surprised to read in the *Grocer's Advocate*, which I now take weekly instead of the *Spectator*, an appeal thus, "Cultivate a telephone voice, a gracious, pleasant one, and let your customer hang up first." There hang the customers, rich, ripe fruit on the orchard boughs, like the fruit of King Louis, but no longer able to worry about sugar or other trifles.

It is, however, not merely a question of a kind and pleasant voice. In one of Mr. Bernard Shaw's older plays there is a sentence which is full of illumination. "Nowadays," he says, "we say unkind things in a kind way." There can be no doubt that this is a general criticism of our standardized expressions. We are understood to intend to be rude and uncivil, but we state our intention in a kind way and with a soft voice. I would protest against this. It is only in so far as the standardized expressions lead us to be really kind and really helpful that they are of value. They must not cloak stubbornness and bureaucratic sternness. They must indicate a standardized sensitiveness, a corporate spirit of service, a passion for help. Otherwise they are mere expressions, mere words, utterly detached from fact and act.

"I WANT THE BISHOP"

There are other aspects of the influence of telephony on human intercourse. Not only is speech standardized and economized, but we learn a desirable frankness and simplicity. For example, if we were to ask to speak to the Duchess of Hammersmith we should not say, "May I please speak to Her Grace the Duchess of Hammersmith?" as we should write it on an envelope, but having described the lady by a mere number, we should say to the complacent housemaid, "The Duchess, please." Similarly having got through to what I believe is called a palace, we should not ask for "The Right Reverend the Lord Bishop of Tewkesbury, D. D.," but on the other hand, with a sense of camaraderie which is most desirable in every human relation, we should say to his butler, or valet, or secretary who answered the telephone in the

first instance, "I want the bishop." Whether in the new social reconstruction which is coming this frank and unembroidered relationship will spread I am unable to prophesy, but if it does spread, that the telephone is the important agent in directing it, is, I think, beyond question.

DEVELOPING COUR .GE

We might take another aspect showing the influence of the telephone in inculcating personal courage. Before the invention of the telephone, a visit to a dentist meant shrinking on the doorstep. Now you ring him up and make an appointment, for as yet it is not possible to draw teeth by telephone, though it is possible to put teeth on edge by telephone. Having made the appointment, you are done for. True to precedent the tooth will stop aching a quarter of an hour before the time at which you are due at the dentist, but the telephone has tied you up. You have got to go. It is no use, though an aching molar should play tricks upon you. Rather than be pulled out it stops aching, but the telephone stands no nonsense. That tooth has got to come out.

This is mere physical courage, of course, but it is very curious how mental courage can be developed by the telephone. We can say things by telephone which we should not like to say face to face even with all the agents of the wink and the nod and the genial smile, and the other softening influences which convention has cultivated. For example, I believe one of our most exalted chiefs asked a telephonist a certain question the other night, and she replied, "Yes, dear." Now that is what we should all like to say to him, for it expresses the situation precisely, yet none of us would have the courage, and bold as she was she would not have had the courage if it had not been that they were separated as well as associated by the telephone.

WHEN EVERYONE HAS A TELEPHONE

From this we conjecture what it will mean when everyone has a telephone. When every artisan's house is in potential connection with every other artisan's house, when every fishwife can relieve her soul without restraint, when every dominating squire and lady bountiful can ring up every tenant or neighbor and explain the economic system to them, when every church warden can ring up every parishioner and hale him before the telephone bar of justice for his absence from church or other appalling delinquencies. For we are very much alike, after all. Froissart made his counts and nobles neither clothe themselves, nor talk, nor pray, nor swear like other men. Whatever may happen to us in this unpoetic day in respect to our prayers, at least we swear alike —so, I think, every telephonist would say.

A friend tells me of a Methodist preacher who gathers his little body of fellow-worshipers around him by means of the telephone, giving them a preliminary outline, so to speak, of the spiritual theme which it was proposed to discuss. Indeed I am not surprised that the telephone should thus assert itself in the spiritual realm. The clumsiness of table-rapping is obvious to any of us who have learned the value of the telephone.

POSSIBILITIES OF THOUGHT INTERCHANGE

It needs no great powers of imagination to foresee the possibilities of interchange of thought in the case of journals and newspapers, when every reader can ring up the leader writer and tell him frankly what he thinks of the leader writer's views, if indeed in that happy day there are any leader writers, since they may become leader speakers, when public men can address a public meeting on an elaborated multiplex system which is almost too overwhelming to conceive, and bring their moving oratory to our firesides. In that day there will be a sense of fellowship and of cohesion which today we lack; there will be a directorship in thought and in language which today is provided by convention, by pleasing our neighbors, by the growth of slang and corrupt words; then there will be a development of courage and individuality in mind and outlook which may redeem even the vastest of democratic organisms from what may seem to be the evil side of its dominion over thought and will. Whether you and I will live to see that day or not, it is just as well that we should place it before our minds, but I confess I was startled to see a notice in a restaurant reading, "Dinners ordered by telephone sixpense extra." Perhaps it did not mean what it said, and any excuse for putting on sixpense in these days is not to be despised.

FITTING THE HUMAN SPECIES FOR THE USE OF THE TELEPHONE

The germs of development which will lead to such an improvement in the human species, and in its capacities and endowments, as will fit it for the use of the telephone, are present in the telephone organism which more or less successfully we are handling today. If we fail to see the vision in its true perspective, it is because, as de Maistre said, you can see nothing when your eyes are pressed against the object. Our eyes are pressed close against the telephone system, which is our day by day work, and perhaps we do not see in its fullness all that it is capable of, and the full and wide influence which it is bringing to bear on social development and on human life.

For my own part I believe that the telegraph and the telephone have their place, and an important place, in that spiritualizing of human relationships which is the only progress worth having. To turn the clumsy written word into the less clumsy vocal word is not merely a convenience: it is a step toward a more exquisite and a more refined and a more intimate means of communication. Its rapidity is not a matter merely of speed, in that speed means impatient haste, but it means and includes the overcoming of obstacles and the bursting of barriers. I read the other day that a pork pie took ten days in coming at Christmas time from Staffordshire to London. I could not help but reflect that for a smaller cost than a pork pie entailed they might have had a tender intercommunication of thought, and though I am a firm believer in pork pies as a concrete (so to speak) offering, yet there is more to be said for the abstract gift. I am not at all on the side of the Spoon River poet who swept all materialistic progress away with the sneering stanza:

> To turn out typewriters,
> To invent a new breakfast food,
> To devise a dance that was never danced until now,
> To urge a new sanitation, and a swifter automobile,
> Have the life-surging Heavens no business but this?

To that I should reply that the typewriter and the new sanitation and the automobile, and the telegraph and the telephone may be the media through which the life-surging heavens will influence the world. They may be the instruments which we shall use with more abundant benefit when we realize their value as warps and woofs in the weaving of our social fabric; they may modify many of our social habits, our speech, our manner of address; they may teach us the soft, modulated voice which means the refinement of courtesy; but above all they may lead the social organism to be more sensitive to individual needs, more ready to provide, in so far as it is well to do so, for the gratification of those needs, and by these and other means they may tend to that

closer corporateness of life which is insistently demanded by the spirit of the times.

THE REALM OF WOMAN'S RESPONSIBILITY

It is worthy of notice as a final word that there lies a philosophy in the fact that the actual performance of telephone work has become an important portion of the realm of woman's responsibility. In that precious story, "Diana of the Crossways," George Meredith has a thousand references to the essential characteristics of womanhood, but none is more enlightening than a sentence very near to the close of the book: "True poets," he says, "and true women have a native sense of divineness of what the world deems gross material substance." Our fierce and angry days are not the days for poetry, and we have to ask womanhood to give us this insight into the divineness of material substance. It is a sacramentalism, a consecration of commonplace things, which too easily we overlook.

It is well for the world that the telephone was not invented earlier in the Victorian epoch. If it had been it would have been a man's machine. The clumsiness of the railways is largely due to this fact—ponderous locomotives, growing more and more ponderous, heavier trains, size and avoirdupois being their masculine merits.

The telephone came on the eve of a daintier period in industrial development, a period when women were beginning to refine the sordid machines of the individualistic day. It came to bring to coarse commercial relationships the fine touch of exquisiteness to teach us all not merely to bear each other's burdens, but to behold, under our very eyes, that our burdens were being borne for us, to show us that our word of command was being waited upon and that we were woven into the body corporate and to bid us realize that it might be well for us to lose our identies in the great ocean of human mutual indebtedness. It came to rob us of the cheap distinctions of the Victorian epoch, the silly name on the garden gate and the sillier name in the register of baptisms, and for them to substitute the democratic blessedness of a number; it came to teach us directness of thought, simple sincerity of utterance and readiness of response.

Like the post office girl in Henry James's beautiful novel, "In the Cage," you, my sisters, look out on a world which it is given you to mold. "What she could handle freely," she said to herself, "was combinations of men and women. The only weakness in her faculty came from the positive abundance of her contact with the human herd." I daresay you have similar abundance of contact, but I am sure that you do not regard your subscribers, in Mr. Henry James's phrase, as "the human herd."

The American Telephone and Telegraph Company bids its operators be interested in their subscribers. It it too mild. I bid you to fashion your subscribers as you would have them be. I want you to take the hard-hearted banker in hand and teach him that there is a kindly sentiment in the world; I want you to fashion the suburban grocer into a Sir Galahad, striving for the inner vision; I want you to transform the lawyer and make him a philosopher, the plumber and make him a lover of his kind, the journalist and make him a poet, the theater manager and make him a purveyor of wholesome joy as his share of helping forward the progress of the world.

I bid you remember that every act of switching you perform is one more link in the beautiful golden chain which you are welding. It is not merely the pleasing of a customer; it is making the customer pleasing; which is a different matter. It is setting forth from these centralized positions which, stupidly, we call exchanges, such a stream of widening influence in courtesy, in readiness to help, in sensitiveness to appeal and in tenderness of judgment as will lay its softening and refining touch on a hard though malleable world.

Thus it is the best of all influences in such a reconstruction as will modify social relationships and the spirit which lies behind them, and will achieve the ultimate construction of a social state which will be responsive to each demand, will be quick to each offence, and will be the basis and the bond of a spirit of fellowship which will burst the barriers of clan and section, and will fashion for the world anew the utopia of which our fathers have dreamed.

Helping Real Estate

Real estate men are fairly entitled to be designated as pioneers; they are the ones who in a large measure direct the trend of city expansion. With quick and intelligent perception they select the best locations for "outside" development. These are studied from the viewpoint of practicability, beauty, convenience to transportation, sanitation and marketability. After applying these tests, initial steps are taken: Street lines are laid out, lots are platted, pavements and roadways constructed, sewers built, and trees set out. Then the publicity campaign is launched and soon a few homes are built, then more homes and before one realizes it, a new suburb has come into being and is annexed as a part of some "greater" city.

In their constructive work the real estate men are ably assisted by the telephone company, says F. M. McEniry, commercial superintendent of the Wisconsin Telephone Company. No new development takes place that escapes the eye of the telephone engineer and before the first house goes up, he has made surveys and worked out plans to supply the addition with telephone service. Months before there can be any profit on the investment, money has been expended for the installment of facilities estimated as adequate to meet the requirements of the neighborhood, these estimates being based in turn upon computations covering years of experience in watching the growth and expansion of towns and cities, not in one or a few localities, but throughout the country.

This policy of looking into the future and anticipating the public's need for telephone service is by no means confined to new real estate developments. In all of our cities, telephone engineers are constantly watching the changes in localities; where business is creeping into residence sections, the demand for private branch exchange and trunking facilities will probably increase; where neighborhoods are changing from residence to apartment house occupancy, the number of subscribers will probably increase greatly and wherever the growth, from whatever cause, heavily increases the telephone demand, extensions must be made to existing exchange buildings or new buildings must be erected and additional central office equipment installed.

Telephones in Gas Masks

Gas masks or helmets are worn by the members of the trench rescue brigade, who are called upon to go forth and carry prostrate soldiers from their positions where they may have fallen between the trenches, when overcome by the gas cloud. Each gas helmet and mask is fitted with a novel and specially designed telephone outfit, properly connected to a trailing wire leading back to the trench, so that the rescuers are able to telephone for aid without removing their helmets or apparatus.

Joint Pole Construction Discussed

Report of the Engineering Section, Pacific Coast Section N. E. L. A.

CHAIRMAN J. E. WOODBRIDGE, having explained that San Francisco is only starting joint pole construction, but even in starting has learned some things, he asked J. M. Barry, formerly city electrician of San Francisco, to tell about the organization of the committee there.

Mr. Barry stated that in San Francisco the joint pole system was started about a year ago. At that time there was considerable agitation for additional underground districts. In order to satisfy the public demand for better pole conditions, the board of public works, the city department of electricity and the representatives of the various railway, power, telephone and telegraph companies got together for the purpose of organizing a joint pole committee.

The joint pole scheme was not new with all the companies. Some of them had been operating under such arrangements in Oakland and in some of the smaller towns, and it was simply a case of adapting already established methods to San Francisco. The companies showed an excellent spirit in getting into the proposition, and since the organization a year ago many pieces of joint construction have been satisfactorily completed. The movement has resulted already in a falling off of the demand on the part of the improvement associations and the city for additional underground districts. An ordinance in San Francisco authorizes the city to require that poles and wires be removed from 2½ linear miles of streets each year. At the present prices of materials, 2½ miles of underground construction annually would be a heavy burden, and the companies have welcomed relief from any direction that it could be found. The good record of the companies represented on the Joint Pole Committee has this year obviated the necessity of an ordinance requiring additional underground construction. This is a highly creditable showing. Under certain conditions, underground districts are desirable, but in San Francisco new districts have not always been wisely chosen. For example, the last one to be declared is very largely residential, with scattered loads, and is not a good underground proposition from an economic standpoint. It is hoped that joint pole construction rather than new underground districts will be the means of improving conditions in such localities in the future.

In connection with operation under joint pole conditions it would be well for the companies involved in the joint construction to complete their joint construction as soon as possible after deciding upon it. Very often, construction originates from a complaint from an improvement association because of bad pole conditions in some street. The intentions of the member companies are good, but there has been a tendency on their part to let the joint construction work go over until more important work had been disposed of. The result is that there have been one or two instances where the improvement associations have questioned the good faith of the companies and have been on the verge of starting agitation for additional underground districts. For this reason it is well for all parties interested to prosecute their joint pole work as diligently as possible.

S. J. Lisberger, who has served on that committee, says the organization of the Joint Pole Committee is not difficult. The principal object in an organization undertaking joint pole work is to appreciate the object you are trying to accomplish and most difficult of all you will find the prejudices and feelings of loyalty on the part of the several companies about to enter the agreement. If these will be thrown aside and if you will put yourself into the shoes of the other fellow, you will have wiped away most of the obstacles. There is always the feeling that one company is trying to get the best of the other and it will take some little time and effort to overcome that difficulty.

Joint pole construction is advisable where several poles are likely to be located in the same locality. It is advisable from the standpoint of public opinion and there is no doubt that it does tend to relieve the burden of placing wires underground.

Joint pole construction, however, is not the ideal condition from the operating man's point of view. Many wires on the same pole are not ideal. It is true there is no more difficulty in having all the wires on one pole than in having several poles alongside of each other, but if the several lines can be routed so that there will not be a multiplicity of wires on the same pole, it will be far better than having 11,000 volt, 2,400 volt and 500 volt secondaries of several different companies on the same lead.

Joint pole construction is ideal from the point of the public under certain conditions. It is not the ideal on the part of the operating companies under the same conditions. This is particularly true in territories where ice and sleet are more prevalent.

Chairman Woodbridge remarked that in joint pole work, as in a good deal of other work, electric companies often deal with other interests, notably the telephone interests. H. S. Warren, who had spoken about inductive interference, and handles much of their relations with other interests, was asked for his views on joint pole work.

H. S. Warren said that the agreement which is made between different companies entering into joint use is a very interesting document. Of course, primarily, an agreement is a legal rather than an engineering document, but it is one of those things that has to be worked out jointly by the engineers and the lawyers. It is one of the most interesting and most difficult subjects to get on an absolutely equitable basis. He had, he said, for a couple of years been trying in conjunction with the lawyers to get up some equitable agreements on the several bases that Mr. McDonald mentions, joint ownership, permanent right, rental on the basis of space, rental on the basis of attachments. There are some situations where joint ownership is not regarded as the best arrangement.

The specifications from an engineering standpoint are the most important thing. Touching on the question recently mentioned as to the desirability of joint use, it is almost wholly a question of the specifications followed whether joint use is desirable or not. About 10 or 12 years ago in the vicinity of New York there was a great deal of joint use, which had grown up indiscriminately. There had been no specifications covering it. The com-

*Telephone Engineer, May, 1917.

panies made attachments on one another's poles as seemed easy and convenient, and the result was that there were not adequate clearances and due regard to safety, and there were a great many accidents. So many accidents, in fact, that the companies took the question up and made a thorough study of it. A committee was appointed of two representatives from the telephone company and two from the electric light companies, who worked about a year and got out an agreement and specifications. The specifications have been used very generally by the asso--ciated Bell companies, so that, without any exaggeration, a great majority of the existing joint use is in accordance with that specification. Substantially the same specification is used in Los Angeles and in other parts of California. That agreement and specifications were included in the report of a committee of the National Electric Light Association five or six years ago, and a very similar specifications was worked up by the American Electric Railway Association about 1913 or 1914. This last specification is a little more general than the former one, but, insofar as they cover the same ground, they are about alike and there is no great difference of opinion on any of the engineering points unless it be that some of the power companies do not see the advantage of the voltage limit. In a general way the telephone company is strongly in favor of joint poles under proper circumstances, that is, with the class of electric circuits used in distribution where the lines of an electric company and the telephone company must necessarily be close together, joint poles are much preferred to conflicting construction.

When it comes to transmission lines of an electric company, there we find a different state of affairs, and under present conditions joint use would hardly be desirable, although there may be exceptions. As a general rule the longer lines had better be kept apart as long as that can reasonably be done.

The question of country distribution has not been studied very fully, as it arises more particularly in the western states. However, if the voltage is high, as long as there is room to keep apart, it is better to do that, so far as any economic question is concerned. That is, the mere saving in a joint line would not be a sufficient justification for the hazard of going into joint construction with a high voltage line. Of course, if the voltage is low enough so that no especial hazard exists, it would be the same as town distribution and joint construction would be desirable.

E. R. Northmore remarked that ten years ago, when joint pole construction was commenced in Los Angeles, there were three electric, two railway and two telephone companies operating on separate pole lines trying to occupy the same streets together. These seven companies formed a joint pole committee and the specifications applied to the conditions at that time, but state laws, railroad commission rulings, changes in the N. E. L. A. specifications, etc., have so changed the construction that these specifications and contract are not now suitable for the work, and experience has shown that a joint pole contract should be drawn up to cover every possible contingency and the specifications made so that the joint pole committee can change the specifications as conditions, laws and other changes come up. This joint pole committee in Los Angeles has been working harmoniously for ten years. By co-operating and working together trying to settle the difficult questions that some up by seeing them from the other fellow's viewpoint as well as their own, they have been able to settle practically all questions unanimously.

It is found that operating and repair cost on line construction has decreased at least fifty per cent on account of joint pole work. One of the great helps is pole moving made necessary by street improvement work. Formerly the city engineers and the contractor would telephone every pole using company in the city advising them that street work was to be done on certain streets and for them to take care of their poles. This necessitated the sending of men by every company to attend to the work. The joint pole secretary is now made the clearing house for all work of this kind. All communications concerning work of this kind are sent direct to the joint pole secretary who, after inspecting the work to be done, makes the necessary recommendations to the companies who are interested in pole moving on that individual street. This prevents the unnecessary trips of the companies who have no poles, or whose poles happen to be in the right location.

Mr. Northmore disagreed with Mr. Lisberger that there are conditions where combination poles are not advisable, and cannot conceive of any proposition where a combination line would not be better than two, three or four lines placed on the same street. If lines get so heavy that they cannot be supported on combination poles it is then time to either go underground or string part of the lines on another street.

R. E. Cunningham pointed out that most joint pole agreements, principally the Los Angeles agreement, are on the joint ownership basis, because once having recorded the combination it takes care of itself as a matter of record after that. But in a number of cases it was necessary to consider a rental basis. This has been the case with the Independent telephone companies who do not care to consider the joint ownership agreement. He does not favor the rental agreement because it necessitates each year checking up all the existing joint poles and preparing bills to cover the rental from one company to the other.

C. O. Poole raised a question as to how it is working out and is going to work out in reference to franchises. There may come a condition where one company might work itself out of a street entirely and have no rights there. The franchises given today call for specific streets and they can only build on those streets. It might be possible where one company in some locality might have all the franchises and the other party would have nothing to operate under.

J. E. Macdonald answered that it is assumed each company participating in joint pole construction in any location has a franchise to operate in that location. If this is the case, its rights to set poles or own poles would not be affected by its participation in the joint construction.

The most vital part of the joint pole scheme is that of proper records. The Los Angeles system expanded from less than 3,000 poles recorded in 1907 to nearly 23,000 recorded in 1916. The problem is simple until replacements begin to be required, and the fact that the amount involving each pole replaced is small demands an extremely simple method to prove effective. Formerly it was necessary for the committee to make an inspection of all combinations as well as replacements, and as the territory covered a large part of Southern California, the cost of recording a combination pole or a replacement was excessive in some cases. About two years ago, the committee undertook to solve this problem so as to avoid unnecessary duplication of functions by the committee and the companies' employes. Records are now made and settlements effected in accordance with the

data furnished to the committee by the companies. The disposition of joint property removed from service is another item which should have special consideration. In many cases the poles removed from service are of little or no value, but it is quite essential that each company should receive its proper proportion of the salvage value. Standard salvage values have therefore been adopted. An attempt is first made to divide the property equally among the joint owners and the remainder, if any, is taken by one of the joint owners, preferably the original owner, and the other companies are authorized to bill against this party for the proper proportion of the salvage value.

Texas Independents Ready

"First Independent Company A" of the Signal Service Corps, U. S. army, has been sworn in and ordered out for training. This company was raised in Waco, Texas, and is made up entirely of Independent telephone men gathered from that field throughout the state of Texas. Captain J. D. Milburn, who has had his headquarters in the Texas Telephone Company's building for the past month, has closed his office preparatory to reporting with his company for training. W. S. Smith, of Cooper, Texas, is first lieutenant of the Independent company.

Waco, prominent in many military activities and in the recruiting of men for the government service, has therefore to its credit this signal service company. The Texas Telephone Company of that city, working under the auspices of the Texas Independent Telephone Association and of the group organization of Independent telephone companies for the Southern states, furnished the "sinews of war" in the way of expense money and other facilities for Captain Milburn's work. This company also furnished a large number of the men for the service, the management notifying all its men in Waco and elsewhere who were qualified for the work that it would not stand in their way if they wished to join, and arranging to furnish employment for those who wish the same with the company after their period of service.

The following Waco young men go in this company: P. M. Deely, James D. Gardner, Martin B. Hardin, Edgar W. Holland, R. E. McCormick and W. L. McCollum. The other members of the organization are recruited from a large number of Independent telephone companies in many towns throughout Texas. All the members have passed their final examination, and the company is recruited to full strength.

That the Texas Telephone Company is prepared to answer "ready" to the call for telephone service at Camp McArthur was the statement by President J. B. Earle of the company. Mr. Earle has received from Major Clifton, United States Signal Service, Fort Sam Houston, a tentative outline of the telephonic requirements for the camp, and the material for the work is practically assembled. Immediately upon notification as to the exact location of the building at the camp in which the telephone exchange for the post is to be located, the company will begin the erection of the lines to the site.

Camp McArthur will require the construction of a telephone exchange sufficient for a small town. The equipment will be of the magneto type; this type of apparatus has been found more suitable for the purpose and is being specified by the government, it is understood, for all guard camps. There will be from fifty to one hundred telephones located on the camp grounds proper, besides which the company is making provisions for a number of private telephones near and around the camp. The company will also install a large number of "pay stations" near the camp and on the camp grounds, for the use of the soldiers and the public; these will be connected direct with the Waco exchange. Sufficient trunking lines will be furnished from the camp exchange to the city exchange, both to the local and the long distance switchboards, so that the army officials will find no delay in reaching Waco or other towns by telephone.

Officials of the telephone company state that the gathering of the necessary equipment for this undertaking has been a task. It is practically impossible to obtain telephonic apparatus from the manufacturers at this time. The Texas Telephone Company, stated President J. B. Earle, has now orders on file with every manufacturer of telephone equipment in the country, but to obtain shipments of the material is almost impossible. Telephone instruments and similar equipment are being received by express, so urgent is the need for them.

Competition Useful in Cleveland

J. J. McCormick, a Cleveland attorney, has started to organize telephone subscribers in a campaign for better service.

He asks subscribers to sign a pledge to change to the rival company if the service of the one now the subject of greatest complaint is not improved. Most complaint has been made against the Cleveland Telephone Company.

"The company is violating its contracts with subscribers," he said. "Its service is unreasonably slow. If a sufficient number of subscribers are ready to withdraw in a body its officials will give heed to protest against the service."

Councilman Townes will urge the Ohio State Utilities Commission to speed up an investigation of Cleveland's bad telephone service. The investigation was ordered when the council adopted Townes' resolution, asking the Commission to take steps to improve service. Two other resolutions aimed at better telephone service were introduced.

Councilman Becker proposed the Cleveland Telephone Company and the Ohio State Telephone Company should interchange service on a toll payment plan.

Councilman Sulzmann's resolution asked the attorney general of the United States to report on the feasibility of public ownership of telephones.

Council's committee on telephones made a report, saying service of the Ohio State Telephone Company was "found in good shape," while the Cleveland Telephone Company "is insufficiently equipped and its employes apparently overworked."

Automatics for Railway

Automatic telephones, which dispense with the services of operators, probably will be installed by the Miami Mineral Belt railroad, to be used in dispatching trains. The telephone system will be owned by the company and installed when all stations have been completed.

It is believed that this system will prove very successful in the dispatching of trains. The dispatcher's office will be placed in Miami, Mo.

The system probably will be installed when the stations on the main line have been completed and other stations, which will be erected later, will be connected when completed. It is said that the new system gives quicker service and also that fewer mistakes will be made, which is an essential requisite to the dispatching of trains.

The Engineer in National Affairs

Address at Special Meeting of American Institute of Electrical Engineers

BY PRESIDENT H. W. BUCK

THERE has been much discussion concerning the position of the engineer in modern times, but conditions are changing so rapidly and points of view are undergoing such a fundamental evolution that it is well from time to time to review the relations of the engineer to his surroundings and to secure if possible the proper orientation.

The change and improvement in the engineer's position in the world in recent years have been so rapid as to surprise even those who were the optimists in the under-dog days of the engineering profession. In the middle of the last century, when the engineering and technical schools began to be formed in this country by men of far-seeing vision, the classical scholars looked on askance and took pains to differentiate these upstart institutions from their own traditional schools of learning and to ostracize those who pursued the new courses by classifying the professions as "learned" and technical.

Times fortunately have changed. The engineering profession is coming into its own. Today the engineer is being swept along by a tide which he himself has created with an irresistible force, and it is well therefore for the engineer to take his eyes off his work occasionally and to observe his constantly changing surroundings. A flood of scientific and technical accomplishment has swept over the face of the earth, revolutionizing life, commerce and international destinies. Even the turmoil in which the world now finds itself can probably in the last analysis be traced to the over-acceleration of world affairs resulting from the work of the scientist and engineer.

In all this development period of the engineering profession during the last century the engineer has worked his way along alone and in silence, so to speak, seeking his reward rather in the joy of accomplishment and in the realization of his dreams than in worldly recognition and accumulation. The very inherent greatness of the pioneers who have laid the foundations upon which we now build prevented them in a way from acquiring a more worldly position in affairs. This tradition, however, is not a virtue beyond a certain point, and the engineer by nature is too willing to give way to others. The time has come when he should take a more worldly position in the world which he himself has created.

In our general relations to intellectual development we may consider that we are just emerging from a classical period where tradition, custom, prejudice, ignorance and dogmatic religion were the controlling forces. Movements which took place in world affairs were largely political, following the paths best suited to the advantage of the ruling classes. There was little real progress, because there was no development of scientific knowledge and its application in engineering. Scientific truth held no standing. The worship of tradition caused a powerful reaction against any scientific discovery which might necessitate a readjustment of established habits of thought and life.

For centuries before the dawn of the scientific and engineering era great changes took place throughout the world, but little real progress occurred. Races rose and fell, always falling back to the starting point, for there can be no upward trend in racial development without the solid basis of scientific knowledge to grow upon. China made great progress and developed its early civilization under scientific activity, but during recent centuries it has lived under the worship of classical tradition and has become inert.

A constant change in point of view, which is so largely brought about through developments in scientific knowledge, seems to be necessary for progress in civilization. Our civilization today differs from that of a century ago in proportion to the scientific and engineering evolution which has taken place during the period through its reactions on life in all of its phases. Such discoveries in science as the law of gravitation, the evolution of species, the laws of electromagnetic induction, etc., have probably had a more profound effect upon the development of the human race than any other acts in history.

The engineering profession has passed through the preliminary stages of its growth and has reached a position where the engineer should work and act not only with proper attention to his work itself but with full consciousness of the important relation of his work to human affairs in general. Among the early pioneers in engineering were many notable instances of men of great breadth of view—men like Watt, Fulton, Whitney, McCormick, Erickson and others. Specialization had not at that time begun to work its narrowing influences. Of recent years, however, under the stress of commercial development and economic conditions, increasing specialization has taken place and the engineer has become obliged to compass his mind with an ever-narrowing horizon. This specialization produces extraordinary proficiency in particular fields, but has the objectionable effect of narrowing the character and outlook of the man and of reducing his value as a citizen. We must take care lest commercial considerations and the modern mania for efficiency in the narrow sense force our engineers to lose sight of the world around them in their concentrated attention to the part rather than to the whole. This excessive specialization is a danger which threatens the future standing of the engineer.

It is interesting to recall in this connection the results of a recent canvass made by a joint committee on education on the qualities which, in the opinion of about 5,000 leading men, engineers and others, best fit a man for a successful career as an engineer. As a result of this vote only thirteen points out of a hundred were assigned to purely technical knowledge as an essential, the other eighty-seven points being allotted to broader qualifications, such as judgment, character, human understanding, etc. This is merely a quantitative statement of the many general demands now being made of the engineer, and it illustrates how his work has broadened out. It is an interesting and encouraging symptom.

A most significant movement of recent times in the engineering world has been the development of co-operative action among engineers of all classes, and this tendency will, I believe, serve to offset the evils of specialization. It is the growing recognition of the fact that all branches of engineering are interdependent. We electrical engineers, I believe, are well aware how much

we need the assistance of other branches of engineering for the successful fulfillment of our purpose.

THE ENGINEERING COUNCIL

This co-operative movement has quite recently been given tangible expression in the formation of the Engineering Council, an act, I believe, of far-reaching consequence. Under this organization as a beginning the civil, mechanical, mining and electrical societies, together with the United Engineering Society, are tied together for co-operative action through a joint body of twenty-four representatives. This body will meet at frequent intervals and will deliberate on matters of general interest to engineers. It is an encourgaing beginning toward universal co-operation among engineers in all branches of work.

In this Engineering Council we have for the first time an engineering body representing about 30,000 engineers of sufficient scope and standing to create an engineering public opinion. Its influence is likely to be far-reaching in building up the prestige of engineers in both technical and civic affairs. A further development which has reached full recognition only in recent times is the mutual appreciation which has grown up between the engineer on the one hand and the worker in pure science on the other.

The engineer looks to the scientist to provide him with raw materials of knowledge with which to work out his applications, and the scientist must look to the engineer to make his discoveries so fruitful that the full effectiveness of his work on the frontier of research can be sustained. Both are working together in order to unfold nature in the most effective way for the benefit of man.

We electrical engineers, I think, feel a particularly close bond with the pure scientist in that recent developments in physical science have disclosed an intimate relationship between electrical phenomena and the nature of energy and matter.

All of the important movements taking place at the present time which center around the engineer and his work mean, I believe, that the engineer is soon going to leave his position of isolation in independent fields of work and realize that he owes an obligation to the community broader than his daily engineering work and will contribute to the general welfare his talents and experience. It matters not whether the problems before him are political, sociological, industrial or technical, I believe that the engineering type of mind, if the proper breadth of view has been acquired, is best fitted to undertake them.

It is not necessary, perhaps, in important administrative positions to have civil, electrical or mechanical engineers as such, but we do need men in those positions who have had training of the type which engineering gives, with the mental balance, the power of analysis which such a training develops, the resourcefulness and the faculty of recognizing and properly apportioning the various elements in a problem. There is a quality of mental honesty which engineering experience highly develops which is sorely needed in public life. The scientific and engineering professions should rise up and furnish such men from their ranks for the welfare of the country.

The classicist contends that a world dominated by scientists and engineers would be cold, materialistic and atheistic, and lacking in those qualities of art and sentiment and the imaginative outlook which every civilization so highly prizes. To this doctrine and its injustice to the engineer I want to take emphatic exception. The world today may be inclined toward materialism, but it is not dominated by the engineer—far from it—but by other classes.

The engineering mind, on the other hand, numbers among its characteristics a highly developed creative imagination and possesses to a high degree exactly those qualities of mind and temperament best suited to combat materialism. There have been many instances in history of great artists who have been great engineers and vice versa, and I believe that the two temperaments lie in close relationship. Furthermore, scientists and engineers as a class have a strongly developed spirit of international understanding and sympathy which may serve as an important safeguard against excessive nationalism and excessive aggression as well.

And so I believe that we can confidently look forward to a new era for the proper fulfillment of the destines of the engineer. Out of this world chaos we now see men of engineering and scientific training rising to positions of commanding prominence on all sides. It is simply the working of the inevitable law of the survival of the fittest.

In this great movement not only must the individual engineer play his part, but the great engineering societies must realize the power of influence which they are developing in an ever-increasing degree in the community at large and the obligations which devolve upon them.

Loaded Telephone Circuits

*Characteristics, Testing and Design of Loading Coils and Field Testing Sets—Concluded**

BY W. N. FURTHMAN

ALLOWING for a reflection loss at the testing end of each circuit of ½ the values given on curve *A* of drawing, Fig. 5, for the different subscribers' loops involved, the attenuation values of the circuits themselves are:

Loaded side circuits, 1–2 or 3–4, one mile = .030 miles of No. 19 ga. .054 mf. cable.

Other loaded 12's, 7–8 or 9–70, one mile = .0325 miles of No. 19 ga. .054 mf. cable.

The results indicate that these two particular loaded side circuits are somewhat more efficient from a transmission standpoint than the loaded 12's with which they were compared. This might be explained on the assumption that the old loaded circuits have deteriorated somewhat, although even now the latter circuits are as efficient as the average loaded No. 12 gauge circuits. It should be noted, however, that the average spacing of the loading coils on this line is only 7.78 miles. This would tend to give a smaller attenuation value than would normally be the case.

The experimental transmission equivalents of the loaded phantom between Brushton and Newtown Square as obtained from the results given above are:

For 3 mile subscribers' loop at testing end, 8 miles of No. 19 ga. .06 mf. cable.

For 0 mile subscribers' loop at testing end, 10.3 miles of No. 19 ga. .06 mf. cable.

In addition the reflection losses at the testing end, for which values of 1 mile and 2.7 miles have been allowed for the tests with 3 miles and 0 mile subscribers' loops respectively, the above equivalents include a reflection loss at the junction point of the loaded phantom and non-loaded No. 8 gauge circuits which were used in conjunction with the phantom. This latter reflection loss is estimated to be about .5 mile of cable.

With the above assumptions as to reflection losses, the average attenuation of the loaded No. 12 gauge phantom between Brushton and Newtown Square is:

$$\frac{(8.-1.5)+(10.3-3.2)}{2} \begin{cases} = 6.8 \text{ miles of No. 19 ga. .06 mf. cable.} \\ = 7.15 \text{ miles of No. 19 ga. .054 mf. cable.} \end{cases}$$

Attenuation per mile experimental = .0258 mile of No. 19 ga. .054 mf. cable.

Attenuation per mile calculated = .0275 mile of No. 19 ga .054 mf. cable.

NOTE: During the transmission tests on the phantom and side circuits no phantom repeating coils were used, and no repeating coil losses had to be considered.

Owing to the short length of the loaded phantom it was impracticable to obtain and eliminate the reflection losses experimentally. It should be noted, therefore, that the

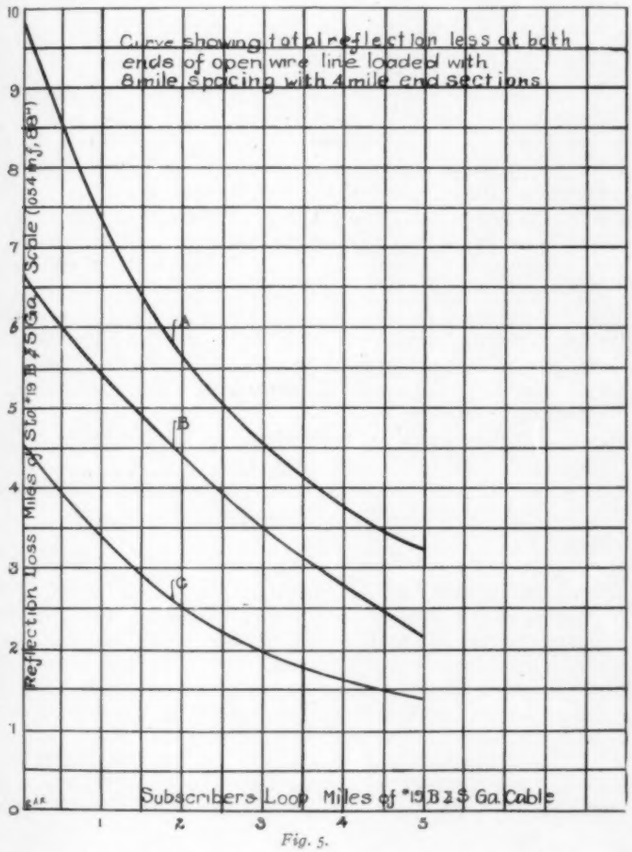


Fig. 5.

attenuation value just given cannot be taken as the correct one for this type of circuit until it has been verified by tests on other loaded No. 12 gauge phantom circuits. As stated above also the average spacing of the load coils on this circuit is only 7.78 miles.

Crosstalk Tests: A number of tests were made to determine the amount of crosstalk between the phantom and its side circuits. The testing circuit used was as shown on drawing Fig. 1, and the crosstalk values given below are those which were obtained in regular talking tests. The crosstalk tests between Pittsburgh and Newtown Square were for the most part made with the distant end of each circuit closed through a 1,200 ohm resistance.

In all of the tests four phantom repeating coils (two at each end) were used, which were practically free from crosstalk, the unbalance in the coils when tested in the standard manner being:

	Crosstalk units
Coil No. 1	40
Coil No. 2	20
Coil No. 3	60
Coil No. 4	50

All of the crosstalk obtained, therefore, has been charged up to the circuits themselves.

It is to be understood, of course, that during the crosstalk tests the wires were balanced both in regard to insulation and resistance.

Results of crosstalk tests between Pittsburgh and Newtown Squares; tests made at Pittsburgh:

1. *With special repeating coils and no composites—*

	Crosstalk Units		
	All Circuits Open at Newtown Square	*All Circuits Short Circuited at Newtown Square*	*1200 Ohms Across Each Circuit at Newtown Square*
Phantom to side 1–2	1300	1500	1100
Phantom to side 3–4	750	1100	800
Side 1–2 to side 3–4	200	275	275

2. *With special repeating coils and with specially balanced composites—*

Phantom to side 1–2	....	....	1100
Phantom to side 3–4	....	....	1000

3. *With regular commercial repeating coils and with selected regular commercial composites—*

Phantom to side 1–2	....	....	1400
Phantom to side 3–4	....	....	1000

4. Tests, in which the special repeating coils were used together with different regularly used composite sets, showed that the increase in the crosstalk between the phantom and its sides due to the different composite sets used varied from 0 to 1,000 crosstalk units.

5. Tests in which the special repeating coils were used together with the specially balanced composite sets which at the testing end were arbitrarily unbalanced to different degrees, showed:

a. If the inductances of the two retardation coils in one side of a composite set used on the loaded side circuit are each within .02 henry of the inductances of the two retardation coils respectively in the other side of the same composite set, no noticeable increase is produced in the crosstalk between the phantom and that side, due to the use of this composite set.

b. For a difference of .3 henry between the inductances of the two retardation coils in the Morse legs of the composite set on one side of side circuit, and between the inductances of the two retardation coils to ground in the two sides of the telephone branch of this composite set, and provided the coil of smaller inductance is in each of the two cases connected to the same side of the side circuit, the crosstalk between the phantom and this side circuit is increased to uncommercial values due to the use of such a composite set on the side circuit.

NOTE: This variation in inductance (.3 henry) is slightly less than is allowed between different commercial retardation coils. It should be noted, however, that the inductances of the two windings of each coil must agree closely by specification limits, and for the normal method of connecting retardation coils into composite sets, no crosstalk trouble between a phantom and its sides due to unbalanced inductances in the side circuit composite should be experienced.

c. A variation in capacity of from 2 mf. above or below the normal values, in the composite set on a loaded side circuit either in one Morse leg to ground, or in the capacity to ground in the corresponding side of the telephone branch, causes no noticeable increase in the crosstalk between the phantom and this side circuit.

d. A small difference in the capacities in series with the two wires of the telephone branch of a composite set on either side circuit causes crosstalk between the phantom and that side. Tests have shown that on a loaded No. 12 gauge phantom com-

bination for each ohm difference (on the basis of 800 cycles) between the reactances of the above mentioned capacities the crosstalk between the phantom and that side is increased by about 110 crosstalk units. As the normal value of the capacity in series with each side of the telephone branch of the composite set is 2 mf. and as the commercial variation in the condensers used for this class of work is about 10 per cent, it is apparent that unless special precautions are taken a difference of .1 mf. may readily exist between the capacities in series with the two wires of a side circuit. For a loaded No. 12 gauge phantom combination, this would mean an increase in the crosstalk between the phantom and that side of about 500 crosstalk units.

6. Summarizing the results of the crosstalk tests on the loaded No. 12 gauge phantom combination, it may be said that the crosstalk between the phantom and its sides is fairly high, but entirely within commercial limits; that this crosstalk may be largely increased unless care is used to pick out well balanced composite sets for use on the side circuits of such a combination; that it is not very difficult to obtain suitable composite sets, although at times it may mean the use of sets containing retardation coils and selected condensers in the telephone branches.

The crosstalk values given under "1" above indicate the amount of crosstalk which is to be charged up to the line itself, and due primarily to the loading work and the transposition system used. While no experimental values of the average crosstalk on non-loaded phantoms, transposed in the same way as the experimental loaded phantom, are available, this particular phantom transposition combination permits of only relatively short exposures, phantom to its own sides, and it is felt, therefore, that most of the crosstalk obtained is due to the loading coils.

Noise Due to Use of Composites: From a noise standpoint tests showed that if one side circuit is composited the other side circuit must be composited also, in order for the phantom not to be made noisy, and that composite sets which are suitable from a crosstalk standpoint are suitable from a noise standpoint as well, and cause no noticeable increase in the noise on the circuits.

Morse Operation Tests: Morse was operated on the four wires of the loaded phantom combination for a period which included both good and bad weather conditions, and for both duplex and single line Morse service. The evidence of telegraph cross fire from one wire to another was no greater than with ordinary loaded circuits, and in fact for bad weather conditions the wires of the loaded phantom combination seemed to give slightly better results than wires of ordinary loaded circuits.

The Morse thump in the telephone circuits due to the telegraph operation on the wires of the side circuits, was as a rule somewhat greater on the phantom circuit itself than on either of the side circuits. For no combination of Morse working, however, with normal composite conditions, was the thump thought to be sufficiently great to interfere with the service at telephone subscribers' stations.

In an experimental installation of loaded aerial phantom wires, one-fourth of the Philadelphia-Chicago Line, Newtown Square to Brushton (Pittsburgh), electrical data on the load coils actually used is given:

TABLE I. INSPECTION DATA.

(*A*) *Side Circuit Coils.*

		Averages		
Line	*Ckt.*	*R. d. c. Ohms*	*R. 1780 p. p. s. Ohms*	*L. 1780 p. p. s. Hen.*
Brushton—Newtown Square	1–2	2.42	14.4	.263
	3–4	2.42	14.7	.262
Brushton—Dallaston	1–2	2.42	14.5	.263
	3–4	2.42	14.9	.263
Brushton—Bedford	1–2	2.42	14.0	.262
	3–4	2.41	14.4	.263
(*B*) *Phantom Coils.*				
Brushton—Newtown Square.	Phantom	1.17	7.9	.159
Brushton—Dallaston	Phantom	1.17	7.8	.159
Brushton—Bedford	Phantom	1.17	7.9	.159

In Table II are given the probable net average impedance values offered to the phantom circuit and the phantomed circuits by the group of loading coils at each loading point:

TABLE II.

Line	*Ckt.*	*Resistance in Ohms @ 600 p. p. s.*	*800 p. p. s.*	*Inductance Henrys @ 600 p. p. s. 800 p. p. s.*
Brushton—Newtown Square	1–2	6.79	7.94	0.2676
	3–4	6.83	7.98	0.2666
	Phantom	3.61	4.36	0.1604
Brushton—Dallaston	1–2	6.80	7.95	0.2676
	3–4	6.85	8.00	0.2676
	Phantom	3.58	4.32	0.1604
Brushton—Bedford	1–2	6.75	7.90	0.2666
	3–4	6.79	7.94	0.2676
	Phantom	3.61	4.36	0.1604

It is general knowledge that by means of the Shreve Repeater and the standard types of aerial and cable loading coils it has long been possible to operate long distance telephone circuits between Boston and Denver. It is not generally known, however, that a radical design in loading coils was necessary before it was possible to operate a long distance circuit between Boston and San Francisco. It has recently been claimed that it was only possible to talk commercially between Boston and San Francisco by the additional use of an Audion Repeater designed by Dr. De Forest.

The writer has not been in active association with the Bell Telephone Company since 1915 and is not thoroughly acquainted with the design and success of this repeater. I do know, however, that in the years 1914 and 1915 the Bell Telephone Company spent large amounts of money in experimental engineering work, that brought about in those years the large installation of the new high efficiency coils along the entire line between Boston and San Francisco. This replacement of the old type of loading coils with the new is, however, a sufficient action of progress in itself to warrant a discussion of the merits of the new design of loading coil. The unusual transmission features involved in the design of a loading coil are of course also to be considered in the design of the new high efficiency loading coil. They are briefly tabulated as follows:

(1) Elimination of crosstalk in loading coils. Duplex cable, and connected circuits.

(2) The problem of preventing the magnetization of a loading coil by limiting the current used to less than .15 amperes.

(3) The causes of magnetization of loading coils and the destruction of uniformity of loading by these causes. Further causes of magnetization are adjacent high potential currents and by means of lightning.

(4) The necessity of meeting all of the issued involved in 1, 2 and 3 from an engineering standpoint to bring about successful service under all possible conditions between Boston and San Francisco.

In considering a discussion of the new high efficiency loading coil, it is necessary to discuss its use with the Shreeve repeater. It may be of interest to note here as a matter of fact that all of the so-called faults or latent defects of the Shreeve repeater were in reality due to unforeseen defects that might occur in the old type of loading coil. The unsatisfactory operation, so called, of the Shreeve repeater used in connection with loading coils may be said to have led to the consideration of the new design of high efficiency loading coils. A good deal of valuable time and money involved in completing successfully the circuit between Boston and San Francisco was lost by placing primarily the fault of the circuit upon the shoulders of the Shreeve repeater. While a part of the blame may be placed against the design of the re-

peater, most of it was ultimately placed where it belonged.

It is not generally known that repeater sets are used in connection with the Shreeve repeater. These sets consist of retardation and repeating coils, that are toroidal in form and are similar in design to a loading coil. It will be clear, therefore, that it is primarily essential that these retardation and repeating coils shall be as highly efficient as the loading coils in the circuit. In redesigning the loading coils it was also necessary to consider the redesign of the repeater sets and to incorporate all of the desirable new features of the loading coils in the retardation and repeating coils of the repeater sets.

The very close proximity of the receiver and transmitter parts used in the design of the Shreeve repeater is likely under certain conditions to cause the repeater to howl or sing. This howl or singing of the repeater is similar to the result obtained by placing an ordinary receiver in close proximity to a regular transmitter of the same set or circuit. The objection of this disturbance becomes readily apparent.

In adjusting a repeater for either a loaded or nonloaded line it will be evident that any line condition that may arbitrarily cause an unbalance will cause the Shreeve repeater to howl or sing. While it is possible to foresee some of these conditions and allow for them in the design of such a device, it is somewhat a scientific problem to allow for those line characteristics that can not be foreseen or allowed for. These characteristics may be crosstalk, unbalanced capacity, mutual capacity, mutual inductance, inductance unbalance or unbalance of alternating or direct current resistance. The combination of all these or of two or more may exist or be automatically brought about. This is particularly true of a loading coil circuit, either aerial or cable. In other words the presence of a loading coil used in connection with a Shreeve repeater, may materially add to the operating company's troubles as well as to its benefit from a transmission standpoint.

When it is understood that all of the unforeseen characteristics referred to in the preceding paragraph have an inherent presence in the design of a loading coil and the duplex cable with which it is connected, it will be clear that the problem is of some magnitude. That they may be thoroughly controlled and limited for the time being even, is some source of gratification. That they may automatically reappear, due to mechanical or electrical disturbance, becomes a matter of upkeep and further engineering effort.

It will be remembered that only a small part of the transcontinental line is equipped with underground cable and cable loading lines. When it is stated that a stroke of lightning in any given aerial loaded section may cause the magnetization of a loading coil anyone would be justified in questioning the advisability of loading a telephone aerial circuit. To think that magnetization, and of course uneven magnetization, may thus bring about all of the conditions heretofore described is almost unbelievable. When it is frankly admitted that a loading coil is as sensitive as a watch or even more so, to magnetism the idea of placing it on a telephone pole to be exposed seems to be the height of folly.

Because of this high degree of sensitivity and the many complexed scientific problems involved in its design and construction it would seem similarly foolish to suggest the use of a buzz saw in its redesign. The use of such an instrument has, however, brought about the new high efficiency loading coil.

The so-called high efficiency loading coil is sawed at two intersections in the case of the side circuit phantom coils and at four intersections in the case of the phantom type of coil. Naturally this air space brings about a field of high magnetic reluctance that must be immediately overcome. This is accomplished by using a brass double pointed connector that is partially forced into the core of the coil at each intersection. An adjustable brass band is then placed about the completed coil. By means of this adjustable band all of the electrical characteristics of the coil may be determined and positively maintained against all mechanical and electrical disturbances.

It will be clear that this desirable condition is not only of large value after the coil is in service, but is also of great value from a manufacturing standpoint. Because of its intrinsic worth, therefore, a good deal of time and money should be used in properly applying a buzz saw to a loading coil.

It will be evident from the principles herein set forth that the loading of a telephone circuit will emphasize all of the faults of such a circuit. This is true not only of the circuit itself but is also true of outside disturbances that may affect a telephone circuit, such as high potential power and light circuits. This rule applies not only to open wire circuits but also to cable circuits.

The remedy to be borne in mind at all times is balance, balance and then more balance.

In any line of endeavor two wrongs do not make a right nor do two rights in some instances make a wrong. A well known law of physics teaches us that provided a start is made with two unequal forces traveling in parallel and in relation with each other, equal additions to such forces will only bring out their unequal relations. So it is with loading a telephone circuit; emphasis is added to unbalances.

Transposition of aerial lines may then be said to be an attempt to correct a wrong condition that should not have been present to start with. It is at best a makeshift plan. In transposing, using general terms, an effort is made to bring about a different relation of the plus and minus poles of the disturbing magnetic causes. It will be clear that these causes may be in the line itself and in addition to any outside disturbance.

In transposition of causes in the line itself it will be evident that while a different relation of the magnetic poles is obtained no remedy for correcting the many unbalances is successfully made. Therefore any outside disturbance that is present will add again to the crosstalk or noise that may be present.

Before loading a circuit was used transposition was considered a cure-all for telephone lines. It was soon found, however, that the old method of transposing on a single pin was absolutely harmful. Then the trouble was blamed on the glass insulator and finally a double petticoated porcelain insulator was substituted. Let it be said right here as a fact: the double petticoat insulator was an improvement not from a transposition standpoint but solely as an insulator. It was also suddenly discovered that all the transposing in the world would be useless provided unbalance was caused by low insulation of either wire that was transposed. So be certain you have high insulation previous to any worry about transposition.

In order that this point may be made clear, a duplex cable is a good example. In the manufacture of duplex cable many pairs and quads are used. One of the most fundamental principles followed is to balance every mechanical and electrical condition that may be present. This plan is not only followed out for manufacturing results but also for those composite results that are found in connecting many lengths together in a long line. Bal-

ance is the watchword and Balance becomes the continual countersign. When it is considered that unequal amounts of moisture can bring about unequal balances in a cable perfectly equal otherwise, some idea can be obtained of the effort that must be made to maintain and preserve that most essential element of all called balance.

Twisting wires of a pair or a quad with the utmost care will still bring about unbalances electrically provided the soft copper wire that is used becomes stretched more in one pair of a quad or one wire in a pair. Until this fault was detected in what was considered a perfect method of operating mechanical twisters, unbalances in duplex cable were deep and ghostlike mysteries. By a process of elimination every other method failed; the proof, therefore, is beyond any question.

Provided that many pairs of a large duplex cable can be balanced in micro-microfarads as low as an average of 25, proof is also at hand that the problem can be solved correctly and properly maintained.

It might be well to point out here that most telephone experts agree that by placing badly exposed wires in a cable, even though this cable is aerial, all unbalances, such as magnetic, inductance, capacity, noise, and crosstalk disappear. It is generally supposed that the lead sheath around the cable is the wonderful curative. The writer has positive evidence that a lead sheath provides a ready path for all magnetic disturbances. Provided the sheath was of soft steel it might do some good.

The real benefit derived from a cable at points of exposure is due to the fact that our old friend *balance* is present in all his glory. The wires when twisted are balanced. With the results of this experience before us it is difficult to understand why so many evident unbalances are permitted to be installed in an aerial line. Even the A. T. & T. Co. engineers, who are thoroughly acquainted with the results of their difficulties in the manufacture of duplex cable, will on the other hand permit their plant department to overlook all of their preliminary laws in running their line wires. The fact that they permit and sanction transposition is proof positive that they also are attempting to correct their own faults of installation.

Provided it is possible to balance unbalance capacity, inductance unbalance, direct current resistance, mutual capacity, and moisture in duplex cable, the writer is certain that any pair of wires separated by air on a pole may be properly balanced without transposition.

Another law of physics plainly states that provided two forces absolutely equal are put in parallel motion and in relation to each other, equal additions to such force will not affect their original equality.

Outside disturbances to telephone wires that are therefore equally applied to both wires will not bring about cross talk or noise, provided the wires are equal in all balances that are essential.

Harmonics in power circuits that are not dependent on the original frequency of the source of energy will, however, disturb any well balanced telephone line. The remedy of this condition must, however, be corrected by the power company, and almost all of the state commissions have so ruled.

In considering the loading of a telephone line, it must be made plain that it is a fallacy to put a new roof on a leaking foundation.

Provided the prospect of loading of any circuit will point out and bring about the useless expense of transposition some good will have been done. Many dollars will be saved by simply improving the present universal method of installing ordinary telephone wires.

The writer has balanced leaking coils so that practically no cross talk remained. He has also balanced duplex cable so that unbalance was eliminated when measured in micro-microfarads. There can be no question, therefore, that the elimination of unbalance, noise, and crosstalk in cable or open wire circuits is also due to be eliminated, provided the proper remedy is applied.

Northern Indiana Meeting

Between 75 and 100 telephone managers and owners and about an equal number of operators attended the annual meeting and operators' school of the Northern Indiana Telephone Association in Warsaw and at Winona Lake on Thursday, July 19. The telephone men held their business meeting in the Warsaw public library and the operators' school was held at the Winona Lake Hotel, being in charge of W. S. Vivian of Chicago.

The address of welcome was by Mayor B. F. Richardson of Warsaw, and the response by J. W. Scott, manager of the Commercial Telephone Company of Warsaw. E. E. Daicey, president of the South Bend Home Telephone Company and president of the Telephone association, presided, and during the afternoon gave a talk on "Legal Phases of High Tension Interference." J. K. Johnson of Indianapolis, telephone engineer and appraiser, spoke on the subject, "Making Friends for a Business." M. F. Hosea, manager of the Citizens Telephone Company of Columbus, Ind., spoke on the subject, "Value of Toll Business of the Small Company to the Large Company." H. M. Friendly, assistant to the president of the Indianapolis Telephone Company, discussed "Telephone Transmission Problems."

The telephone owners and managers enjoyed a banquet at the Hays Hotel in Warsaw and the operators were guests at luncheon at the Winona Hotel. The visitors inspected the plant of the Commercial Telephone Company, recently installed at a cost of $20,000 and classed as the finest small city plant in the country.

Bell Semi-Annual Statement

The American Telephone and Telegraph Company has made public its earnings and a comparative statement for the first six months of 1917, closing June 30. The statement shows dividends of $13,968,644 paid in in the past six months, compared with $13,253,106.08 in the six months last year; interest and other revenues from associated companies, $8,580,213.71, compared with $6,874,308.74 last year; telephone traffic net, with one month not fully reported, but estimated, $4,754,480.13; this year, $4,197,037.32; other revenues, six months this year, $1,136,824.41; last year, $859,577.94; total revenue for the first six months this year, $28,440,162.25; same last year, $25,184,030.08. The expenses for the six months this year were $3,672,813.93; for the six months last year, $2,725,155.38. Net earnings this year footed for the six months, $24,767,348.32; last year, $22,458,874.70. Interest to be deducted for the six months this year, $5,171,443.22; last year, $3,287,791.67. The balance available for dividends on the company's own stock this year, $19,595,905.10; last year, $19,171,083.03. Dividends paid this year in the six months were $15,839,804.64; last year, $15,425,007.88. The balance to surplus this year in the six months was $3,756,100.46; last year, $3,746,075.15. The total operating revenues of the Bell Telephone system in the United States for five months to May 31 were $120,077,825, compared with $105,500,128. The surplus earnings in the five months this year were $8,964,454, against $9,085,145 in the same period last year.

European Telephone Development

Translations from the Foreign Press and Communications from European Engineers

BY FRED W. SCHOLZ

DURING the last four years prior to the war the Paris telephone system has been steadily improved with three objects in view: assuring the system the needed room for expansion with the growth of the city; eliminating all the causes of trouble that were shown to be present at the time of the last flood of the Seine river, and developing and improving both local and interurban telephone traffic.

Since the fire which destroyed the Gutenberg exchange all the intermediate boards have been provided with safety fuses. In order to reduce the duration of interruption of business to the minimum in case one of the safety fuses burned out, an electric alarm system has been installed, which operates and notifies the force of trouble. The safety fuses are set to melt under a current of one ampere. The type which was installed in the last of the exchanges completed carries a heating coil, which is supposed to break the contact circuit when a current of 0.5 amperes passes over it for a time of 30 seconds. A safety fuse wire is also used which melts at once under a current of 6 amperes.

In almost all the exchanges of Paris an alarm system has been installed near the distributing boards, which is supposed to give notice of breaks in the telephone cables, even when there is no loss of insulation on the telephone wires. This system uses compressed air and functions very well, its only drawback being its extreme sensitiveness, which makes it necessary at times to hunt for leaks which are really not serious enough to pay for the trouble. However, in spite of this little drawback, the system has given excellent results and has several times prevented interruption of service by giving timely notice of breaks.

Very few of the types of cable conduits that are used so extensively by foreign telephone companies have been used here owing to reasons of economy. A conduit containing 24 tubes costs about $19.00 per meter (3.3 ft.), while a special telephone cable gallery would cost about $50.00 per meter. The trenches dug in the street in which the cables are laid are not as easily accessible as the galleries, but they offer about as good protection as is needed under normal conditions. In some cases necessity required the building of special telephone cable galleries, especially in those districts of Paris that are liable to suffer from another inundation of the Seine river. Here the galleries were built far below the street level and attention was paid to the waterproofing by using a specially tested concrete for lining the walls. In other sections the cables have been inclosed in special lead sheets and have been laid in the chambers above the sewers of Paris, which are among the most capacious in the world.

The increase of the number of cable galleries and manholes giving access to the cables and the substitution of cables with 28 pairs to those with only 7 pairs has led to a great improvement of service, as it did away with the enormous number of cables with only few conductors, which often was troublesome when making repairs. The laying of new telephone cables in the city's limits always offers a great deal of trouble not only to the telephone department but also to the city administration. While the gas, water and electric cables have their proper places all laid out in the city plans, as well as in the building plans, the telephone cables have to go wherever they find the most room. Consequently they are often forced to accept conditions that are not up to good engineering and only bring about poor service. The telephone department has therefore conferred with the building department of the city of Paris with a view of introducing an ordinance which would bring about the introduction of proper arrangements for telephone cables as well, when drawing up the plans for new houses.

Most of the exchange buildings have either been remodeled or rebuilt to conform with the designs worked out by the departmental engineers after the Gutenberg exchange fire. The distributing frame, the relays, the repeaters and generators are all installed in one story; in the next story are the multiple switchboards placed in two parallel rows, facing each other and as near the windows as possible.

The most interesting and most recent innovation is the system of ventilation used in the exchanges, called the natural Boyle system. Up to the present time ventilation was obtained either by means of electric ventilators and fans or else by a suction and heating system which was very expensive. In the Boyle system the vitiated air is withdrawn through the upper portion of the room and is replaced with an equal volume of pure air by ducts entering the room at a height of about 5 or 6 feet, i. e., at the height of the head of the average person. The advantage of this system is both efficiency and economy.

Three new exchanges either are in the course of construction or are now actually finished. They are the exchanges "Auteuil," "Elysées" and "Conservatoire." The "Auteuil" exchange has about 32 operators at the A-switchboards with 100 jacks for each, 16 B-operators and 3 intermediate switchboard operator panels with 4,200 general jacks. An extension capable of taking up 10,000 jacks has been provided. The "Elysées" exchange will have 50 of the A-group, 23 of the B-group and 4 intermediate groups with room for 6,300 jacks, also allowing for growth up to 10,000 jacks. The "Conservatoire" exchange uses the Ericsson type of equipment and also has room for 10,000 subscribers.

In order to guard against the cutting off of service through the breakdown of electric power in the telephone districts, each exchange has a reserve emergency power unit to be used in case of a breakdown of the public service. The prime movers are gas engines, fed with city gas and driving electric generators of 300 amperes and 24-34 volts. In one of the exchanges a powerful gasoline engine is used which is belted to an electric current generator, furnishing 500 amperes—24-34 volts.

At the Marcadet exchange the incoming calls have been provided with an automatic call system through the simple act of plugging the jack. The wiring diagram is shown in Fig. 1. When the plug is placed in the multiple jack, the relay *102* operates, the busy lamp *135* lights as also the red indicator lamp, announcing the call, *132*. When the auxiliary line, used here, answers an outgoing call, the relay *C* of 12.000ω operates and the

"busy" lamp *135* is extinguished. The operation of the relay just mentioned controls the action of relay *137* of 50 ohms. As a matter of fact the alternating current passes from earth across the call generator *109*, the interrupter *111*, the lamp *110*, the armature of relay *137*, the coil *112* of relay *A*, the contact *116* of relay *B*, the wire *114*, the line of the subscriber, the wire *103*, the contact *105*, the armature *106*, drawn away from relay *102* and back to earth. When the subscriber removes his receiver, the direct current passes into the winding *112* of relay *A*. This relay has been set so as not to attract its armature when the coil *112* is under alternating current charge and to attract it, when direct current passes. At the same time the indicator call lamp *132* goes out. At this moment a direct current passes from the negative pole over the contact *124* of relay *102*, the wire *122*, the coil *121* of the relay *C*, the coil *120* of relay *A*, the contact *119* to earth. The call cut-off relay *B* will then operate, cut the call circuit and establish the telephone conversation circuit.

The arrangement to send call current only when the auxiliary wire has been connected with the called subscriber, can be applied also to the groups of incoming calls. This is done by using automatic push buttons. Two of

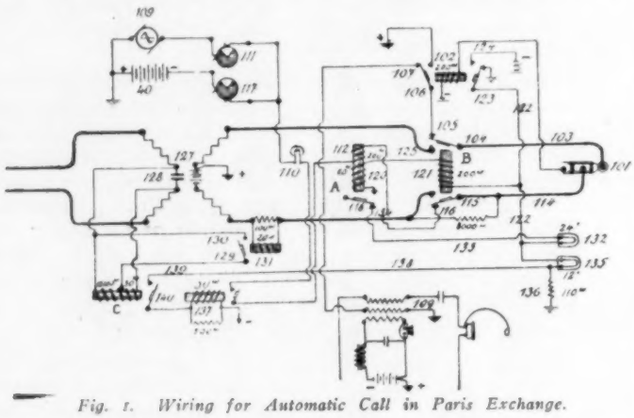


Fig. 1. Wiring for Automatic Call in Paris Exchange.

the Gutenberg switchboards are thus equipped. This avoids calling subscribers when the called parties are not at the other end of the wire. This is especially important where subscribers give the operator a number and ask to let them know when the number has been called and the desired party is on the line. If the wrong outgoing call wire has been used, the operator will discover her error, and will not send out call current until her error has been corrected.—*Annales des Telephones.*

CONSTRUCTION OF PORTABLE INSULATION TESTING INSTRUMENTS

In practical work it is often necessary to test the insulation of a telephone line or cable at any point along the entire system. Measurements of insulation differ from those of pure resistance measurements, in that the results obtained are dependent to some extent on the tension used in the measurement. This is due to the fact that within the current paths, set up between two conductors of different potential, very small air spaces and slight thickness of the dielectric are disrupted, as soon as the voltage has a certain height. The insulation measurements obtained will therefore be smaller in proportion as the voltage used for making the measurements was higher. This dependence of the insulation measurements on the voltage of the testing instruments is also shown in the regulations, which provide that such measurements are to be made with at least 100 volt, or else, if possible with the voltage used in the system to be measured. It is essential for the proper maintenance of an electric system, whether high power or low tension, telegraph or telephone, that insulation measurements be made constantly, so as to detect sudden variations which point to defects aside from the changes due to weather and temperature changes.

The simplest method of making insulation measurements is by the use of the voltmeter. The voltmeter, whose extent of measurement corresponds to the magnitude of the voltage, is connected in series with the resistance X which is to be measured and the source from which the energy is drawn. If the measuring voltage is e volt and the voltage read off on the voltmeter with an inner resistance of w ohm, series connection being used, is Xe_1 volt, then:

$$\frac{e}{e_1} = \frac{X+W}{W}; \quad X = \left(\frac{e}{e_1} - 1\right)w$$

For a given measuring voltage, X can be read off for various magnitudes of e_1 either in form of a table, or else the values of X can be noted down in a special scale next to the volt scale, so that a direct reading of the insulation resistance becomes possible. If the measuring voltage differs from the proper values it ought to have, then X can be computed from the above equation. The voltmeter method has several disadvantages. In case of incorrect measuring voltage, the result can be computed only by calculation and therefore cannot be used very readily for measurements out on the road in telephone systems that extend over large areas. Likewise results are influenced by fluctuations of the measuring voltage, as the current sources, in this case mostly magneto generators, give fluctuating currents. Another drawback is, that just the high insulating values, that are the most interesting, are only obtainable with a slight degree of accuracy. As the equation shows, e_1 becomes very small, when X is large. Attempts have been made to offset this disadvantage by selecting a large internal resistance for the voltmeter, i. e., using a very sensitive direct current measuring system.

Most of these disadvantages can be avoided by using a measuring instrument, a so-called "quotientmeter." Such a system consists of two coils, fastened on a common axis, which therefore oscillate within permanent magnetic fields in such a way that the one coil moves in a uniformly increasing strong field, while the other moves in a homogeneously or uniformly decreasing strong field. The second coil, in case current passes over it, gives a turning movement, whose direction is contrary to that of the principle coil. The current is conducted to the two coils by means of weak and thin metal bands, whose force of direction is negligible.

If now the two coils are so connected, that the main coil is fed by a current i, which also flows through the resistance X to be measured, and that the other coil measures the terminal voltage e at X, then the indicator will show a magnitude proportional to the quotient of the two magnitudes:

$$tg\,\alpha = c\,\frac{e}{i} = c.X$$

The connection of the coils is shown in Fig. 2a. In contrast to the voltmeter method, the pure resistance measurements, following this system, are theoretically independent of the magnitude of the measuring voltage. In actual practice the limits of measurement, at which the instrument gives correct results, is given through the

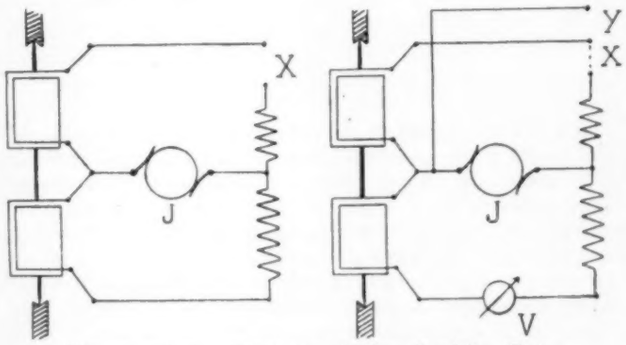
fact, that with very small voltages, the entire turning moment becomes too small, so that the rotation system is not reliable owing to the excessive friction. For with a voltage equal zero, the turning moment becomes likewise zero, i. e., the indicator needle can take any desired position on the scale, when there is no current flowing through.

By using this quotient principle, really accurate insulation measurements with portable instruments have become a possibility, as voltage changes of the magneto generator do not disturb measurement, and fairly high insulating magnitudes can be read off with accuracy. Another advantage is the following: There is no objection to connecting the resistance Y which is to be measured, not in series but in parallel to the principle coil, as Fig. 2a shows. As the current i, which flows through the main coil, is now inversely proportional to the current which flows through Y, the results furnished by the instrument are dependent only on a constant and on the magnitude of Y:

$$tg \propto = c \frac{1}{Y}$$

The course of the scale for resistances parallel to the main coil is therefore the reverse of that of the scale for resistances, which are connected in series as Fig. 2b shows. With parallel connection of the resistance to be measured with the main coil, resistances of from 10,100 or 1,000 Ω can be accurately measured.

The sources of current used for insulation measurements are the voltages of direct current systems and the hand turned direct current magneto generators which are placed in the instruments. Alternating current voltage does not come into question for insulation measurements, as the a. c. instruments are much less sensitive than the d. c. instruments. Moreover the capacity currents which are unavoidable in a. c. can change the final results very much. For the same reason it is inadvisable to use a. c. magneto generators. Dry batteries are only applicable where very low tension measurements have to be made, but where the minimum voltage is 100 volts, it is of course impossible to carry a powerful enough battery in the portable instruments.



Figs. 2a and 2b. Wiring for Quotient Insulation Tests.

The influence of capacity currents is quite serious in pure alternating current, as the capacity resistance, which lies parallel to the insulating resistance, is measured along when using a. c. measuring instruments. It is hardly possible to compute the influence of the capacity current mathematically, as both frequency and the form of curve of the a. c. tension, as also the dielectric losses play a disturbing role. For this reason a. c. measuring instruments and a. c. are used for insulation measurement only when the resistance to be measured is not very high and consequently there is not much of a capacity to be figured with.

It may also happen that the capacity current has a disturbing influence in an imperfect direct current, though not so serious, and in a different way. The polarized d. c. instruments react first of all to the charging current, when the voltage rises from zero to the maximum. After the charging has been stopped and the voltage has the maximum value, rapidly changing capacity currents appear, which originate owing to the varying tension. With increasing measuring voltage the

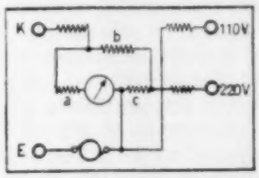


Fig. 3. Wiring for Use of Instrument with Two Voltages.

instrument would show too low; with decreasing voltage, too high insulation values. The average value of the indicator needle remains correct, however. If we succeed in making the frequency of the periodic fluctuations of the d. c. of the inductor so large and the oscillation value of the rotating coil of the measuring system so small, that they cannot follow the rapid current changes any further, then it is possible to make correct insulation tests without any interference by the capacity. The influence of capacity currents with imperfect direct current supply makes measurements more difficult, but does not make them incorrect, as is the case in a. c. It has been found possible, as shown by actual tests, to make an instrument, with a magneto generator, whose voltage curve gives the ideal form.

Aside from the electrical and theoretical requirements a portable insulating testing instrument must also be suitable mechanically. The demands of field service demand a strong construction, able to withstand hard usage and easily handled. When transported and therefore closed, the instrument should show no protruding parts that can be injured. Nor should the instrument be too heavy. There should be two types of instruments, one smaller, fit for low voltage measurement, as that in telephone work, and one somewhat larger for higher voltages. The scale also should not be too small, so that readings can be made without any trouble. It is also advisable to make these instruments so that they can be set down on a support rather than have them hang around the operator's neck. The latter type of instrument, frequently found, often leads to inaccurate work, as the user tries to rush through the test in order to take the instrument quickly out of an uncomfortable position, and in addition it makes the chances of touching bare current-carrying parts greater, which is avoided when the instrument is set down on some base. It is important that the instructions for using the instruments are so placed within the instrument, that they can be read while using the latter for tests. Simplicity of handling is of prime importance and here a special connection is to be mentioned, which makes it possible to use the same megohm scale for two measuring voltages, as for example, 110 and 220 volts. By balancing and changing the resistances *a*, *b*, *c*, seen in Fig. 3, one can arrange that the voltmeter gets half the current for double the measuring voltage, so that all computing is avoided even when measuring with different measuring voltages.—*Elek. Zeit.*

THE WORK OF THE WOMEN IN ENGLISH TELEPHONE EXCHANGES.

England, where the telephone service is now under the Post Office, has seen to its surprise that women can do good work in the telephone and in other departments. One of the workers in the British telephone exchanges, a Miss Heap, has given her impression of the status of women in the Post Office work during the present war, and the account, taken from the French *Annales des Telephones*, offers quite a little interest. Perhaps the best way will be to give her own words, and she writes as follows:

Within the last three years women have gained as important a place in British affairs and industry, as they have not done within all the time since 1881. Let us recall for a moment, the morning of June, 1914, when the news of the murder of the archduke of Austria startled the world. All of us were filled with horror at the news, but no one dreamed what an influence that act would have on the existance of so many of us. Serajevo and its streets were far away from us and the two victims were merely names. If any paper had predicted that England, at the end of two years, was to become a military nation, that the flower of its youth was to be at the front fighting, or else at training camps and that the place of all of these men was to be filled by women the editor would have been laughed at as a pessimist and a dreamer.

But in less than three years thousands of women have been pressed into numerous positions; one hears no longer the question whether women can or cannot do certain things, but only where and how to get the women who can take up the work left by the men who are at the battle front.

Among the employments where women were first called upon to help out were the telegraph and telephone service. Several days before the declaration of war the demands on the telegraph and telephone equipment were tremendous. It can be truly said that both these services have been working at their maximum efficiency ever since the few days before the outbreak of the great war. The telephone department was probably one of the first ones to employ women extensively. February, 1915, when the department heads came to the conclusion that the men of military age in the telephone department ought to be at the front doing their work where needed the most, advertisements were inserted in several of the London dailies, asking for women operators. A large number of women responded at once, particularly those who had been previously employed in telephone work and who had left for various reasons. It was therefore possible to fill out the gaps left by the men by trained women. This was particularly true of the night shifts, which previously had been entirely held by men. More than 600 women were at once substituted for night work. The conditions under which the women operators work are good. They have 48 hours work per week, divided into four nights of 12 hours each. They start at 8 p. m. and finish at 8 a. m. They are allowed an hour for a slight repast and two hours for rest. This last facility has led to the establishment of a special operators' dormitory with 100 beds. The night service has not been impaired either by the employment of a large number of novices; indeed some say it has been improved. However that may be, the general opinion is that the night service with the women operator is far better than it was with the men.

In many cases the night operators were girls of good families, well educated, many of them of middle age, who thus tried to add to their income, while their husbands, providers or supporters were in their country's service. The picture of some of the nocturnal aerial raids comes to mind, where many of the women who were married showed extraordinary courage and zeal. They flashed the news of the raids to various points without themselves thinking of the possibility of a bomb dropping on the exchange. What adds to their nerve is the fact that some of them had children at home and yet they did not let their anxiety as to the safety of the latter interfere with their duty. During all the raids of zeppelins on London, the telephone service never failed and the public owes a debt of gratitude to the heroic women who stayed at the switchboards during those trying times.

It has been said that one of the happy outcomes of the war for England has been to show that women are fitted for any kind of work and that they are willing and do not lack courage to work hard. Many times the plaint has risen that women are not fitted for such and such kind of work. In the county of Lancaster each village and small town, for example, has an official who is called the "knocker up." It is his duty to make the rounds of the workingmen's quarters and to rouse them in time so that they will not be late for work. He carries a long pole with a ball on the end with which he knocks at the windows in the upper stories of houses. In several of the towns this work is now done by women, the men being at the front, and the work is done just as faithfully and efficiently as before.

No doubt some of the opposition to women in various industries has been the fear that they will crowd out the men after the war is over and conditions become normal again. Such fear is very natural. The labor of women has been too much exploited in the past. The remedy does not consist in restraining women but rather in treating her not as a creature of sex but as a citizen. In this war she has shown her claims to equality as a citizen.

In the preceding an attempt has been made to show in a general way the work that women have done during the war in numerous lines and among them in the telephone department of the Post Office. There is a total of 620,000 women at work in the Great Britain and the telegraph and telephone service was the first to substitute women for men on a large scale. The development of the last few years gives great hopes for the more general employment of women in these two lines for the future.

FATAL ACCIDENT THROUGH INDUCTION

In the valley of the Romanche (Isère) are found large numbers of hydro-electric power plants, carrying tensions varying from 25,000 to 55,000 volts. One of the state telephone lines used both for long distance and for local private telephone service runs parallel to the high tension power lines for a section of the line. A short time ago one of the guards along this line was killed while talking through a portable telephone. The inquest held after this fatal accident showed several rather odd facts: 1. On the day of the accident no physical contact took place or could have taken place between the high tension line and the telephone line. 2. The safety fuses of the state telephone line at the pole where the accident took place were in good working order and shocks have been felt by various employees charged with the care of the telephone line. 3. At the time of the accident one of the high tension wires carried an excess voltage of 45,000 volts and the section of line carrying this voltage ran for 20 kilometers parallel to the state telephone line. The abnormal tension which caused the death shock could then not have resulted through actual contact between the two

lines. It was rather caused by an induction phenomenon, in that current from the high tension lines was induced to the telephone lines, which ran parallel for a considerable distance. At the moment of current interruption, one of the high tension wires must have still maintained its high voltage for a few moments, the other wires having already returned to the zero potential. Under the electrostatic influence of this wire, the telephone circuit was thus brought to carrying an excess of voltage which caused the death of the guard.—*Annales des Telephones.*

More Trouble in Chicago

Corporation Counsel Ettelson of Chicago is held responsible, in a bill in chancery filed July 26, for sale of the Chicago Tunnel Company and Automatic Telephone property, a sale, the bill charges, which places public property in jeopardy.

John Fitzpatrick, president of the Chicago Federation of Labor, and of the Public Ownership League, is the plaintiff in the proceedings, which were filed in the Circuit Court late in the afternoon. The attorney of record is Sidney N. Ware.

It is set forth in the bill that the franchise of the tunnel company had been forfeited to the city and that the reasons the city took no steps to take possession of the property were:

That Samuel A. Ettelson was corporation counsel.

That prior to taking that office he had been associated with a law firm which had acted as counsel for the tunnel company.

That the firm, after Mr. Ettelson left it, still remained as counsel for the company.

That after Mr. Ettelson became corporation counsel there existed, and still exists, a close understanding between him and his former partners.

"Your orator charges," says the bill, "that the failure of said Ettelson to take action on behalf of the City of Chicago is due to the fact that said Ettelson has acted for years as the counsel and adviser of the said Chicago Tunnel Company."

After reciting other events leading up to the passage of the sale ordinance, the bill asks the court to do these things:

Find the nature and extent of the property of the Chicago Tunnel Company.

Declare that the ordinance permitting the sale of the property to be null and void.

Restrain the Chicago Tunnel Company and the Illinois Telephone and Telegraph Company from disposing of any portion of the property of the tunnel company.

Declare that the City of Chicago is the rightful owner, clear of all liens and incumbrances, of the plant, equipment and tunnel rights of the tunnel company and of the Illinois Telephone and Telegraph Company.

Perpetually restrain the defendant companies from interfering with the possession by the city of this property.

Forty-seven votes were cast for the ordinance when it was passed by the council on July 6. The bill alleges that such an ordinance, to be passed, should receive the votes of three-fourths of the members of the council, or fifty-three. On that ground the bill alleges the ordinance is invalid. The city is made a party defendant.

Mr. Ettelson is out of the city on a vacation. Chester E. Cleveland, who is acting as head of the city's law department, said he was told by the clerk of the Circuit Court the bill had been filed by Attorney Fayette S. Munro.

"During all the time the telephone ordinance was before the council or committee," he said, "Mr. Ettelson refused to have any part in the proceedings, or to permit any member of his staff to do so, for the reason that while he was in private practice he had represented the tunnel company. All matters pertaining to that ordinance were referred to Walter L. Fisher, special counsel for the city, and he advised the committee and represented the city at all times."

Telephones for Camp Kelly

Camp Kelly, in Texas, soon may have a telephone exchange, the capacity of the exchange and the number of telephones to be installed depending upon the plans of the War Department as to the number of buildings to be constructed at this military center. No orders have been issued as yet for the construction of this telephone system and work will not be started until it is known how much land the government is going to occupy with structures and just what structures are to be equipped with telephone service. The Southwestern Telegraph and Telephone Company is prepared to act as soon as the War Department is ready.

The new exchange at Fort Sam Houston being installed in the quadrangle is nearing completion and it is expected will be "cut in" for service the first part of August. The War Department has reported its approval of young women for operators and the telephone company has begun the selection of the corps. The plant will have a capacity of 750 telephones and will be the same standard and equipment as is used in supplying service for a town of about ten thousand population. On this basis it is large enough to supply a military encampment of from seventy-five thousand to one hundred thousand men.

The site for the new exchange to be installed at Camp Travis has been designated by the War Department and work on the erection of the building will be started within four or five days. This exchange will not be as large as the one at Fort Sam Houston, but will be ample to serve the 40,000 men of the national army to be in training there after September 1. Both exchanges will be so constructed as to permit of increasing their capacity should the occasion arise on short notice.

The foundation for the new exchange for the southern section of San Antonio, corner Grove Place and South Presa has been completed and work on the main structure will be started within a few days and hurried so as to have the plant available for service this fall.

Advantages of Motor Trucks

Some of the many advantages of the motor truck over the horse in the haulage of poles for telegraph and telephone companies are strikingly shown by the records of the New England Telephone & Telegraph Company in the Springfield, Mass., district. Compared on the basis of time only, it has been found that one motor truck and a semi-trailer are equivalent to six horse-drawn outfits. In one period of 115 hours spent in hauling poles the tractor-trailer outfit traveled 441 miles in 12 days at a cost of less than 26 cents a mile. The same work would have required 71 days with horses and the cost would have been 90 cents a mile. The slowness of teams often necessitates the use of additional animals for the transportation of men and tools, while all the materials necessary, including the poles, arrive together with the men when machines are employed.

War Activities of the Bell System

Why Telephone Employes Serve Best by Sticking to Their Posts—From "The Telephone Review

IF the thought should ever occur to any telephone employee that possibly he or she might be able to serve the country better by leaving his or her present work and joining the army or navy, becoming an aviator, or Red Cross nurse, driving an ambulance, making ammunition, or doing something else that has more the flavor of war about it—we say, if any employee thinks of doing these things and giving up the telephone business, we ask him to read seriously and carefully the following article, which describes some of the responsibilities resting upon the Bell system and its organizations, some of the work which it has done and is doing for the government, some of the problems which have to be solved, and something of the part which every employee should regard it as a noble and patrotic duty to perform right in the jobs they occupy.

Immediately upon the breaking off of diplomatic relations the proper officials of the Bell system got in touch with the council of national defense, the president of the war college, the chief signal officer of the army, the director of naval communications, and other officials of the Navy Department. Harmonious and effective methods of co-operation were immediately established so that we have, notwithstanding the extraordinary demands upon us, met in a most satisfactory manner all of the varied and unsual requirements of the government. Some of these requirements and the nature of our activities may be gathered from the following:

PRECEDENCE OF GOVERNMENT BUSINESS

Elaborate plans were promptly worked out with the authorities at Washington, whereby, throughout the Bell system in every part of the United States, all government toll calls, including all departments and officials, were given precedence over commercial business. The giving of special service required extraordinary action on the part of the telephone officials everywhere, which included the special drilling of some 12,000 long line operators in different parts of the United States.

Precedence was also given to installation and maintenance work for the government and, notwithstanding the difficulties of obtaining raw material and finding the necessary labor, and the practical freight embargoes which have existed in many parts of the United States, it has been possible to provide promptly telephone plant required for all of the emergencies of the government which have arisen.

LONG DISTANCE SERVICE BETWEEN WASHINGTON AND OTHER POINTS

The long line facilities in and out of Washington have practically doubled, having been increased from 148 wires to 294 wires. This increase of long toll lines required, of course, a proportionate increase in toll line switchboards and operators. Plans are now making for a still further increase of these facilities, as soon as the manufacturing resources of the country can furnish the required material.

The raw material resources are now being canvassed with a view to the manufacture and laying of a new underground cable all the way from Washington to New York, containing over 80,000 miles of wire, providing at the same time, for service to Baltimore, Wilmington, Philadelphia, Trenton, and other important cities.

In addition to the cable, and also depending upon the availability of manufacturing resources and our ability to get raw material, we have planned to string additional copper wire in many directions. When all this work is completed there will be about 500 long distance wires radiating from Washington as compared with 148 which existed last January. But in order to provide for the heavy requirements of the government growing out of the war, a vast amount of work is of course required in other places than Washington.

GENERAL TOLL SERVICE FOR GOVERNMENT

The toll line situation throughout the Bell system has been carefully checked in detail and provision made so that the government will receive adequate toll service even in case of a very large increase in business. This work has involved, in addition to many other places, the consideration of calls between Washington and the headquarters of all the naval districts, the army department headquarters and other points which are likely to be important to the army, navy, or other government departments. It is interesting to record in this connection that good telephone service can be given between Washington and the headquarters of every army department and naval district in the United States.

Provision has also been made for handling telephone calls promptly even with a large increase in business between the various Army Department headquarters and the state capitols, the various army posts and the national and state mobilization camps in each department.

In connection with the demand for additional and special service outlined above, it has been necessary to make important additions to the toll line plants of the American Telephone and Telegraph Company and its Associated Companies at many places. The transcontinental line between Chicago and San Francisco may be mentioned as an example of this work, where one circuit is sufficient for the existing commercial through business, but where the work has been nearly completed for providing two more circuits the entire distance, thus making three transcontinental circuits available for long haul business, where only one exists today.

SPECIAL PRIVATE WIRE SERVICE

Comprehensive plans have been worked out for special telephone and telegraph wire systems for the exclusive use of the War, Navy, and other departments of the government. In addition to setting aside the circuits themselves, it has been necessary to provide a large amount of special equipment at many of the important points. Over 10,000 miles of such special systems have already been taken from commercial use and devoted exclusively to the service of the Navy, Agriculture, and other departments. In the case of the War Department, little in the way of exclusive wire service has yet been called for, but a very comprehensive system has been worked out in co-operation with the signal corps which will be put into service upon the call of the chief signal officer.

ADDITIONS TO WASHINGTON LOCAL TELEPHONE PLANT

Plans were also made for important additions to the Washington local telephone plant. These plans are now being rapidly executed and the local telephone facilities of Washington are being rapidly increased.

Switchboard additions are being made to all of the telephone central offices in Washington and an entirely new central office, of an ultimate capacity of 10,000 lines, is being installed.

The operating force has been largely increased and will be still further strengthened from a large number of new operators which have been placed in training.

For a number of the government departments, notably the War and Navy Departments, it has been necessary to remove the switchboards, which were ample for peace conditions, and install switchboards needed for the traffic caused by the war. Similar replacements and enlargements are now under way for the Washington Navy Yard, Treasury, and other government departments.

WORK AT ARMY POSTS, NAVY YARDS, ETC.

The telephone companies throughout the Bell system have co-operated with the army and navy authorities in making thorough inspections of the existing telephone plants at all the important army posts, navy yards, etc., and in making large additions to the existing telephone facilities at many of those plants.

In some cases it has been necessary to provide complete new switchboard equipments very much larger than those which existed before, and in other cases, additions have been made to the existing telephone plants in the way of switchboard positions, cable plant, station equipment, and equipment to meet many special military requirements. Some of these enlargements have been necessary simply to meet the increase in activities at these points and in other cases additional plant has been required for special purposes such as the Reserve Officers' Training Camps and the enlargement of the units of the regular army.

MOBILIZATION CAMPS

Notice has been received from the signal corps that the commercial telephone companies must be ready to provide a large amount of telephone service, both local and toll, which will be required at the mobolization camps which will be established shortly for the training of the new army. At each one of these camps it is expected that at least 30,000 men will be trained, and this means practically the establishment of a new city of 30,000 inhabitants for which complete telephone service, both local and toll, must be provided, not only for the military purposes of the camp, but also for the personal needs of the officers and men. It has already developed that 32 such camps will be required for the training of the militia and the first draft of 500,000 men. To provide this service, it will be necessary to build, maintain, and operate all these new telephone systems, which will call for hundreds of positions of special switchboard, a large amount of outside plant, and equipment for thousands of stations. Beyond this it will be necessary to make considerable additions to the local telephone plants of the nearby cities or towns as well as additions to the toll lines radiating from those places. Provision has already been made so that the construction of these telephone systems can be undertaken as soon as the mobilization camps are definitely located.

UNITED STATES COAST GUARD

At the request of the United States Coast Guard officials the engineers of the Bell system have given them a large amount of assistance in working out complete plans for the enlargement of the United States Coast Guard telephone system on the Atlantic, Gulf of Mexico, and Pacific coasts. These plans call for providing telephone connections at approximately 100 lighthouses and 200 Coast Guard stations, and involve laying about 300 miles of submarine cable, construcing over 650 miles of pole line, and stringing over 1,200 miles of wire. This work will involve an expenditure on the part of the Coast Guard of upwards of $1,000,000 and arrangements have been made, at the request of the Coast Guard, to have each associated company perform the work required in its respective territory. In order to connect the Coast Guard plant with the Bell system and provide the kind and grade of service required by the Coast Guard officials, it will be necessary for the various associated companies to make large additions to their own plants.

SPECIAL TELEPHONE FACILITIES FOR THE USE OF THE NATIONAL GUARDS

Many regiments of the National Guard are engaged in different parts of the country in guarding the important railroads, bridges, water supply systems, etc. To facilitate this work it has been necessary for the telephone companies to provide considerable amounts of special telephone service. This has involved the installation in the greatest haste of special station equipment at important points which are being guarded, together with facilities so that communication can be had between those points and other points which are the headquarters for this work.

In order that the government service may be maintained with the least possible interruption, the usual maintenance work throughout the Bell system at points and on lines important to the government has been supplemented by extraordinary tests and inspections, and this sort of work will be continued throughout the present emergency.

WORK FOR THE NAVY

Co-operation with the Navy has been greatly facilitated because they were associated with the company engineers in the work which they did in the successful transmission of speech across the Atlantic and across the continent and the Pacific to Hawaii.

In addition to this, by order of Secretary of the Navy Daniels, telephone officials of the Bell system and navy officers planned and successfully carried out a three-day mobilization of communication forces, during which time war conditions were simulated. This was done a year ago. Instantaneous communication was provided over the wires of the Bell system by both telephone and telegraph from the office of the secretary of the navy at Washington to all the naval stations in the continental United States, and telephone communication was maintained between the office of the secretary of the navy and an American battleship in the Atlantic Ocean.

Plans were then made for communication systems to be established in time of war. It was very gratifying to find, upon the outbreak of hostilities, that these plans were ready. They were followed in every substantial particular, and they have been found in practical operation to be as highly satisfactory as they were in the mobolization conducted about a year before the war.

In the Western Electric Company, and in the Bell headquarters staff, engineers and scientists have been working in close and confidential relations with the officers of the United States Navy. They have devised important wireless methods known only to our own navy, and have produced apparatus which has greatly improved the best hitherto known means of detecting the presence of submarines.

Many other activities of this kind now engage the attention of our engineering and experimental scientists in connection with the work for the navy.

WORK FOR THE ARMY

Co-operation with the army has also been greatly

assisted by the arrangements made by Brigadier-General George O. Squier for the organizing of reserve officers and men for the signal corps, to be available in time of war. The companies of the Bell system, by resolutions of their boards of directors, gave liberal financial encouragement to all who entered this particular branch of the army.

Altogether about fourteen battalions of picked officers and men have been formed or are now forming, prepared to take the field as a part of the United States Signal Corps.

In connection with the work of the army also, the engineering and scientific staff are doing important development work in such matters as perfecting means of communication with aeroplanes and in the improvement of detecting and firing devices for submarine mines, and in many other ways.

TOTAL FORCE PROVIDED FOR ARMY AND NAVY

Mention has already been made of the officers and men of the Bell system who have gone into the signal corps reserve.

At the request of the Navy Department the Bell system has also supplied certain officers for the naval coast defense reserve, to assist the navy in various communication matters.

Altogether, some 2,500 men have been provided by the Bell system for the signal corps and the naval coast defense reserve.

In addition to this, about 2,000 men in the system are members of the National Guard and the Naval Militia or are otherwise under oath to present themselves when called for.

About 150 more Bell employees have already joined the officers' training camps which have recently been established.

This makes a total of over 4,600 men from the Bell system who are now or will shortly be engaged in military service.

This is over 10 per cent of the male employees of the Bell system between the ages of 21 and 30. This number of volunteer employees, furthermore, is about twice as great as the number which would be called for under the draft.

THE INTERNAL PROBLEM

Aside from the requirements imposed by the entrance of our country into the war, the construction program for the telephone companies for the current year is the greatest in the history of the telephone business, due to the extraordinary commercial and manufacturing activity created in this country by the European war. The increased demands upon our government have required that material and apparatus be diverted from commercial use so that the urgent demands of the Army and Navy and other departments of the government could be met. These demands are so imperative and the shortage of material and the difficulties of obtaining labor and transportation are so great that we will be able to meet the still further requirements which have been outlined only by diverting still larger amounts of material and apparatus from commercial purposes to the use of the military authorities.

The crisis from which the country must extricate itself is not wholly external. The work to be done is not only upon the high seas and the battle fields of Europe. It is not sufficient that men, even millions of men, shall go to the front, that transports and guns, ammunition, food, clothing, doctors, nurses, and medical supplies shall be sent with them and after them; it is not enough that $2,000,000,000 shall be raised for the Liberty Loan and another $100,000,000 for the Red Cross.

Greater, far greater than the external problem, is the internal problem. The country must strip itself of every superfluity. It must become frugal and more productive, and it must organize, organize, organize, with the most experienced and capable men and women in authority and in subordinate positions, to perform the Herculean task of systematizing, directing, producing, and supplying the myriad needs of this country and of our allies.

On every hand there is work to be planned, begun, and completed in the shortest possible time, if this country is to render the most effective service while it is most needed. Not only the money, but also the methods, men and women, manufacturers, sources of supply of materials, transportation facilities, and all that goes with the actual participation in the great war, must be made available and productive.

In these circumstances, consultations, the receiving and sending of information, of orders, instructions, and inquiries, the transmission of news and every possible kind of communication, all constitute the very foundation and the bulwark upon which and by which the work in hand must be done, fortified, and speeded up.

It is impossible for all this to be performed speedily and efficiently otherwise than by telephone. No other human agency can accomplish it. Without it, minutes would lapse into days, days into months, and months would spell frightful disaster, for there are not months in which to do the things which must be done in minutes and days.

With all seriousness and an utter absence of boasting, every telephone employee should realize with new consecration and patriotic loyalty that in the words of Major General Squier, chief signal officer of the United States Army, they "can serve their country in no better way than by sticking to their posts."

At the outset there was installed throughout the length and breadth of the country telephone lines and stations binding together the nation for peaceful pursuits, the most extensive and efficient telephone system in the world. Immediately the need arose, the entire plant and personnel became the ally of the government. Before and since the war was declared against Germany the government has found the Bell system prepared and ready to perform every duty and responsibility which the needs of the times demand. The opportunity to do this was accepted as a demonstration of the wisdom and foresight of the founders of our nation in framing the Constitution so as to make possible for commercial purposes such a business and organization as is represented by the Bell system, which in time of military necessity has become the efficient ally of the National Government.

Asks for Colored Operators

Negro girls for telephone operators was the plea of speakers at a Chicago meeting of the committee of Colored Women in Industry, of which Miss Sophonisba P. Breckinridge is chairman. According to a negro member of the committee, Mrs. Irene Goins, the hundreds of young colored women who have come to Chicago find it almost impossible to get work except in the most menial positions, and with low wages. Miss Mary Anderson, of the Woman's Trades Union League, explained this by saying that the negro women did not come to the union. She said that if they would come to the woman's trades unions at once instead of underbidding the white girls in the labor field and then seeking the protection of the union, they would fare better.

Telephone Patents Issued Recently

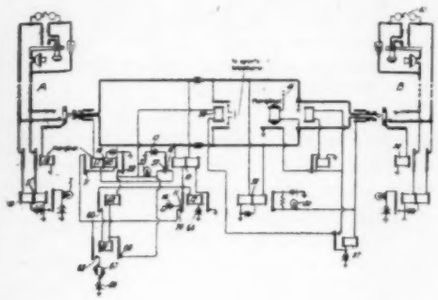
A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

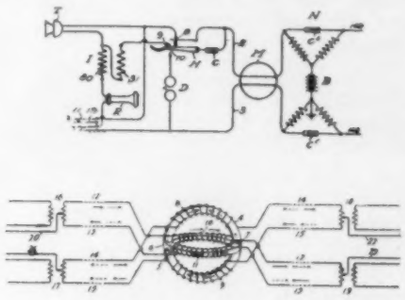
NO. 1,221,182. Supervisory Signaling System. Issued to L. H. Johnson, assignor to Western Electric Company, Inc., New York, N. Y. A common battery cord pair has the usual lamp signals and relays, and in addition it has a locking relay which is charged and locked when the calling subscriber depresses his hook

three lines for a tri-party conversation.

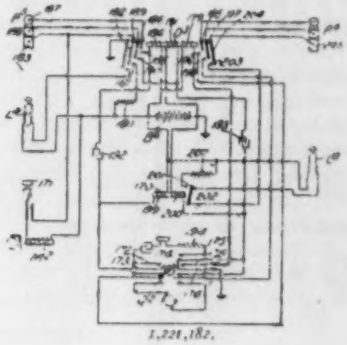
1,221,801. Call Sender. Issued to J. A. Hulit, assignor to Automatic Electric Company, Chicago, Ill. A dial sender for switchboards in which the dial determines the number of impulses to be sent to an automatic switch and in which the impulses are sent by an auxiliary device. An impulse



1,221,404.



Above, 1,221,235.
Below, 1,221,238.



1,221,182.

Should the subscriber then lift his hook, as in working the hook for a second call, still another extra relay is energized and a commutator is connected to the test wire and cut-off relay of the calling line, with the result of flashing the line lamp (as well as the keyboard lamp) of the calling line. Thus, whether the operator's attention is upon the keyboard or upon the bank of line lamps, a flashing lamp will be before her. The claims are directed to the flashing of the line lamp.

1,221,191. Call Counter. Issued to E. Kolossvary, assignor to Western Electric Company, Inc., New York, N. Y. The meter is mounted upon the body plate of a hand micro-telephone for recording the number of times that the device is used.

1,221,235. Substation Telephone Circuit. Issued to A. B. Smith, assignor to Automatic Electric Company, Chicago, Ill. When the receiver is lifted, the speaking circuit is the same as once used by the American Bell Telephone Company (with the receiver upon the line side of the induction coil) except that, by novel hook switch arrangement, the ringer bridge is broken.

1,221,238. Loading Coil. Issued to J. B. Speed, assignor to Western Electric Company, Inc., New York, N. Y. For phantom lines, the coil has two toroidal cores, intersecting.

1,221,262. Automatic Exchange System. Issued to J. L. Wright, assignor to Western Electric Company, Inc., New York, N. Y. An alternating-current hand generator furnishes current for operating an automatic switch. This looks toward automatic switching for farmers' lines.

1,221,287. Trunking Switch for Automatic Exchange. Issued to W. L. Campbell, assignor to Automatic Electric Company, Chicago, Ill. (Application filed July 9, 1907.) An automatic switch, in response initially to line control, operates to select a trunk, and thereafter it is unresponsive to line-loop battery currents or ringing currents. The patent carries fifty-five claims.

1,221,308. Call Sender. Issued to C. L. Goodrum and B. G. Dunham, assignors to Western Electric Company, Inc., New York, N. Y. (Application filed September 4, 1906.) A calling device for automatic telephones. It has a circular dial, and a controlling handle.

1,221,404. Cord-Pair System. Issued to William Aitken, London, England. In a manual common battery cord pair, a relay of seven pairs of points is charged by an operator's key and is held by a circuit from the calling line. The points connect all conductors of the two plugs to the keyboard equipment and when by hanging up the calling telephone the relay is discharged, the two lines are instantly and completely disconnected.

1,221,439. Meter. Issued to E. G. Godfree, Sandringham, near Melbourne, Australia. A central office key (or relay) operates two meters, one at the central office and one at the telephone.

1,221,773. Automatic Exchange System. Issued to A. B. Sperry, assignor to Western Electric Company, Inc., New York, N. Y. A system by which an automatic exchange may connect

spacer splits up the total impulses into groups for the several digits of the directory number.

1,221,865 and 1,221,866. Meter Systems. Issued to L. H. Johnson, assignor to Western Electric Company, Inc., New York, N. Y. A meter to record the calls served by an operator is actuated by her listening key in one patent and by the insertion of the ringing plug in the other.

Automatic for Elyria

The directors of the Elyria Telephone Company have authorized the expenditure of $150,000 to include a new building to cost $36,000 which will house a $73,000 automatic telephone system.

An order was placed with the Automatic Electric Company of Chicago for an automatic central office switchboard and automatic dials for the telephones. A month ago a contract was let with James A. Hewitt for the new building to be erected on the present site on Second street and the work will be pushed as fast as possible so that installation of the new switchboard will not be delayed.

After cutting over from the present manual switchboard to the new automatic switchboard, the citizens of Elyria will enjoy the best telephone service the art of telephony can today furnish. Not only will the subscribers in the city, but the rural subscribers as well, will be able to dial all their local calls without the aid of an operator.

The county long distance service will also be made automatic which will enable the operators at nearby towns to dial all Elyria numbers direct instead of passing their calls to the Elryia long distance operator.

The toll equipment contracted for will treble the present toll facilities which will necessitate the retention of practically all the present switchboard force.

The Black River Telephone Company, at Lorain, is now installing the same type of switchboard.

But for the fight waged against the company before the Public Utilities Commission at Columbus, the new system would be in operation today, says Manager A. J. Curren.

A. I. E. E. Committee Reports

Annual Report of Committee on Telegraphy and Telephony

THE Committee on Telegraphy and Telephony of the American Institute of Electrical Engineers submits the following report for the year 1916-17:

F. L. Rhodes, Chairman,
E. F. W. Alexanderson,
R. E. Chetwood,
M. M. Davis,
C. L. Fortescue,
H. M. Friendly,
F. B. Jewett,
S. M. Kintner,
William Maver, Jr.,
Kempster B. Miller,
H. Mouradian,
W. O. Pennell,
Allard Smith,
John S. Stone,
John B. Taylor,
J. L. Wayne, 3d,
G. M. Yorke.

COOPERATION IN AVOIDING INTERFERENCES

Cooperation between the representatives of lighting and power interests and the operators of telephone and telegraph plants, directed toward avoiding hazards and interference, has progressed, and the engineers of these different utilities are becoming better acquainted with the problems involved leading toward the friendly settlement of differences. Specific cases of interference are being met by the application of principles, some of which have been established as the result of experience, and others which are in more or less advanced stages of development.

TELEPHONY

Applications of the developments which made transcontinental telephony possible have been extended so that now the cities of over 50,000 population in the United States, as well as the territory adjacent to them, have been placed in telephonic communication with each other. These improvements, which have increased the range of telephone transmission many-fold, have been made with only slight changes in the lines and equipment and with no change whatever in the subscriber's station apparatus.

Beyond the advantage to the public of such a universal system of communication, its special value under war conditions, in problems of national defense, is of transcendent importance. This was demonstrated during the past year by a mobilization of systems of communication made at the request of the secretary of the navy. This demonstration was conducted in cooperation with naval officers under the command of the chief naval operations. Continuously during three days the Navy Department at Washington and the navy yards and naval stations in the continental United States carried on all their communication with each other and with the naval force in that territory by telephone and telegraph over the wires of the Bell system. During this period instantaneous telegraph and telephone communication between any points involved in the mobilization was possible.

Included in this demonstration was a test of wireless telephony. The battleship New Hampshire was connected with the system by wireless telephony and was able to receive and send communications while the vessel was at Hampton Roads and even as far out to sea as the southern drill grounds. Conversation between the Mare Island Navy Yard on the Pacific and the battleship New Hampshire while at sea was possible. Captain Bennett, in command of the Mare Island Navy Yard, conversed with Captain Chandler on the New Hampshire, which was at that time in a storm on the Atlantic. This conversation was transmitted over the transcontinental telephone wire circuit from Mare Island, California, to the radio station at Arlington, Va., and there transferred automatically to the wireless from Arlington to the ship at sea, the return conversation taking the opposite course.

The mobilization was intended primarly to test the efficiency of the wire system in time of war. The secretary of the navy and the admiral in command at Washington talked to the commanding officers of the naval stations on the Pacific coast, on the Gulf and Atlantic coasts and on the Great Lakes. The results of this mobilization were most satisfactory and demonstrated that the plant and organization involved were in complete readiness to respond in case of national emergency.

TELEGRAPHY

In the subject of telegraphy, beyond the increasing use of automatic devices and methods, there have been no new developments completed concerning which reports can be made at this time.

RADIO-TELEGRAPHY

Along the lines of commercial application of radio-telegraphy there has been an extension in the long distance service by the Marconi Company opening up communication with Japan via Honolulu. There are also high powered U. S. navy stations located in California, Hawaii, the Canal Zone, and the Philippines. The two German stations located at Sayville and Tuckerton have done a large business in transmitting messages to and from Germany directly.

The tendency in radio-telegraphy in its its use on ships has been toward standardization in the form of the sets. This is particularly true in the spark type of sets. There has been an increasing use of sustained waves on ship stations. The general service rendered by the ship stations has continued to be of large and increasing value.

The used of sustained waves is increasing. The power required for this method is generated by arcs or by high-frequency alternators either directly or through frequency transformers.

$5,000 Damages for 20 Cents

An attempt to collect a twenty cent telephone bill resulted in the filing of a $5,000 damage suit in the circuit court at Taylorville, Ill. E. W. Hight, an Assumption banker and president of the Assumption Telephone Company, is made defendant.

Earl Sarver is the complainant. He charges that Hight, in having him arrested on a charge of obtaining money by false pretenses, injured his character to the extent of $5,000.

According to Sarver, he was arrested and held in jail one week without sufficient cause. He was arrested on complaint of Hight, who alleged that he failed to pay a twenty cent telephone charge, but the case was dismissed by a justice of the peace in a preliminary hearing.

Texas City Asks Interconnection

The City Commission of McKinney, Tex., is entertaining a proposition to pass an ordinance requiring the Onion Telephone Company and the McKinney Telephone Company to give all patrons interchangeable service. Thus a subscriber of either system would have the service of both. The telephone companies have been asked to meet with the commission to show cause why such an ordinance should not be passed.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

Maine

PETITION by New England Telephone and Telegraph Company for permission to furnish telephone service in the town of Garland, Fred D. Wood now being engaged in furnishing similar service in said town under the name of Garland Telephone Company. Petition dated June 19, 1917.

This matter was assigned for public hearing at Augusta, July 17, 1917, and public hearing was held and notice proved in accordance with said order.

Fred D. Wood has been operating a telephone plant in Garland since October 31, 1908, as lessee of property owned by this petitioner. While he does not join in this petition, the evidence presented at the hearing, including a letter from him to the petitioner, shows clearly that he does not wish to continue the business and does not object to this petition. No one appeared in opposition.

The business as at present conducted is not profitable, and an unprofitable business is likely to be an unsatisfactory one—as much so to the public as to the utility. The petitioner will be able to give good service, and undoubtedly will do so.

It is ordered that public convenience and necessity require that a second telephone utility, to wit, the New England Telephone and Telegraph Company, furnish telephone service in the town of Garland.

That said New England Telephone and Telegraph Company be granted permission to furnish such service in said town of Garland subject to all of the provisions of law relating to such service in this state.

Minnesota

The application of the Richmond Telephone Company to increase its exchange and farm line rates was heard by J. W. Howatt, telephone supervisor, and subsequently a thorough examination of the accounts was made. The evidence and reports having been considered by the commission, it finds:

The Richmond Telephone Company is incorporated under the laws of the State of Minnesota, all of the stock except qualifying shares being held by Joseph Schwankl. The exchange of the company is located at Richmond, Minnesota, with a small switchboard at St. Martin. The company serves fifty-seven subscribers at Richmond, eleven at St. Martin, and 258 farm subscribers, on fourteen lines. The company was organized in 1905 and during most of the time, Joseph Schwankl has owned all the stock except certain qualifying shares. Mr. Schwankl owns and operates the drug store at Richmond, and in addition, has been the manager, bookkeeper, lineman and relief operator of the telephone company. Dividends totaling $82.40 were paid in 1906 and 1907.

Excepting for the small dividends paid in 1906 and 1907 and the cash on hand, all the earnings have been put into the property, but there is no evidence showing how much of the earnings was used for construction and how much for maintenance. Up to the last two years, a large part of the manual and clerical work required to maintain and enlarge the plant was done by Schwankl without charge, and rents and operators' wages were kept down to the minimum, the exchange being located in the drug store and Mrs. Schwankl being the chief operator. Operators' wages averaged $39.75 per month and labor $28 per month. Under these circumstances, the surplus grew in twelve years to $10,888.60. The earnings have increased from $397.43 in 1905 to $4,696.50 in 1916, and the operating expenses, exclusive of taxes and interest, from $368.25 in 1905 to $3,144.47 in 1916. Night service is not given.

The point has been reached in the life of the community and the company when good service and business management suggests the wisdom of having a separate office for the telephone exchange, the employment of a regular lineman and competent operators who can devote their time to the public service, and where the owner of the plant should charge it a reasonable sum for the service which he necessarily renders. The present rates will not yield sufficient money to enable the company to be placed upon a business basis, take care of proper maintenance, a 6 per cent depreciation, and a reasonable dividend upon the stock.

Under the circumstances, the commission is of the opinion that the present rates are inadequate and that a just and reasonable schedule is as follows:

RICHMOND.

Business—One-party	$2.25	per	month,	gross
Residence—One-party	1.75	"	"	"
Residence—Two-party	1.50	"	"	"

ST. MARTIN.

Business—One-party	$2.00	per	month,	gross
Residence—One-party	1.75	"	"	"
Residence—Two-party	1.50	"	"	"

A discount of twenty-five cents per month will be allowed on the above rates if the bill is paid on or before the 15th of the month in which the service is rendered.

Multi-party rural service.....$1.50 per month, gross

A discount of twenty-five cents per month will be allowed if paid quarterly in advance before the end of the first month of the quarter.

It is therefore ordered, that the Richmond Telephone Company be required to furnish continuous twenty-four-hour service, to move its exchange from its present location in the drug store to a separate office to be used for the sole purposes of the telephone exchange, and is hereby permitted to publish as reasonable maximum rates, the schedule mentioned herein and to charge the same for the service rendered, said rates to be effective August 1, A. D. 1917.

The application of the Star Telephone Company, Farmington, Minnesota, for authority to increase its local exchange rates at all of its exchanges, was held before Telephone Supervisor J. W. Howatt, after which the Statistical Department of the commission made a thorough examination of the accounts. The evidence, reports and recommendations of the Telephone and Accounting Departments have been considered by the commission and have been filed with and made a part of the record in this case.

The Star Telephone Company is a corporation organized under the laws of the State of Minnesota, with headquarters at Farmington, Minnesota. It operates eight exchanges. It has 1,453 telephones, of which 919 are farm, 182 business and 352 residence subscribers. It does not strictly adhere to its published rates, some exchange and rural subscribers being permitted to talk over the whole system, while others are limited to certain territory. The rates are not uniform at all exchanges.

The original petition sought the establishment of toll rates between all exchanges at ten cents per call for three minutes and five cents extra for each additional minute, but so much objection was voiced by patrons and stockholders that the plan was abandoned and a new petition was filed. No protest was made to an increase of exchange rates. Many patrons favored it.

The company was organized in 1902 and has paid 6 per cent dividends upon its stock each year except in 1902, 1903 and 1915. During the entire period no money has been set aside for depreciation.

For the calendar year 1914, there was a surplus of $1,612.01; for 1915, a surplus of $5,269.87 (but no dividend was paid that year); and for the six months ended June 30, 1916, a surplus of $1,682.30, no allowance being made in this last figure for a prospective dividend. A depreciation charge should have been made to "provide the amounts required over and above the expense of current maintenance, to keep its property in a state of efficiency corresponding to the needs and progress of the industry." While the commission has not definitely determined the rate of depreciation for companies of this class, yet it may be assumed for the purposes of this case that 6 per cent is not unreasonable. Assuming the present value of the property to be 75 per cent of the investment in plant and equipment, this would leave, after deducting depreciation, a return of 2.74 per cent in 1914; .83 per cent in 1915, and 3.56 per cent in 1916, based on the earnings for the first six months of that year. Operating costs show an increasing tendency and there is no evidence that the cost of labor, supplies and materials will soon recede. The present rates are inadequate and an increase must be granted.

Conditions justify the commission in grouping the exchanges into two classes, each class to have its own rate. Farmington, with sixty-four business and 170 residence telephones, should pay a higher rate than Webster, with eighteen business and fifty-four rural telephones. Farmington, Lakeville, Rosemount, New Market and Prior Lake shall constitute one class; Mendota, Lonsdale and Webster, another class.

The following schedule of rates is deemed by the commission is be just and reasonable for the service rendered for the exchanges of Farmington, Lakeville, Rosemount, New Market and Prior Lake:

Business—One-party	$2.25	per	month,	gross
Business—Two-party	1.75	"	"	"
Residence—One-party	1.75	"	"	"
Residence—Two-party	1.50	"	"	"
Residence—Four-party	1.25	"	"	"
Rural	1.50	"	"	"
Extension telephones	.50	"	"	net

A discount of twenty-five cents per month on business and residence telephones will be allowed if paid during the month in which the service is rendered.

Rural subscribers shall pay quarterly in advance, with a discount of twenty-five cents per month if paid during the first month of the quarter.

For the exchanges at Mendota, Lonsdale and Webster:

Business—One-party	$1.75	per	month,	gross
Business—Two-party	1.50	"	"	"
Residence—One-party	1.50	"	"	"
Residence—Two-party	1.25	"	"	"
Rural lines	1.50	"	"	"
Extension sets	.50	"	"	net

A discount of twenty-five cents per month on business and residence telephones will be allowed if paid during the month in which the service is rendered.

Rural subscribers shall pay quarterly in advance with a discount of twenty-five cents per month if paid during the first month of the quarter.

The new rates applied to the same number of telephones and operating costs for the calendar year 1916 would, after deducting 6 per cent depreciation on an assumed value of $75,000, produce a return of 8.29 per cent, or 7.57 per cent on the capital stock. Higher operating costs will prevent this return. The new schedule will entitle all subscribers to the use of the whole system.

It is therefore ordered that the Star Telephone Company be permitted to publish and charge the schedule of reasonable maximum rates stated herein and to permit all subscribers to use the complete system upon payment of said rates. These rates to become effective from and after the first day of August, A. D. 1917.

Application having been filed by the Becker-Mahnomen Telephone Company, in which it is alleged that it is operating a local magneto telephone exchange within the city of Detroit; that it also operates rural and toll lines radiating fro mDetroit; that on August 21, 1916, the Business Men's Association of Detroit served a complaint as to local telephone service demanding that more efficient operating service be furnished and that modern equipment or central energy equipment be installed; that the exchange now has a total of 871 telephones and it is impossible to give first-class service with magneto equipment, and it therefore has become necessary, if first-class service is to be furnished, to install in the city of Detroit a common battery or central energy system; that the applicant has contracted for the installation of a common battery or central energy multiple line switchboard, together with all necessary associated apparatus and telephone instruments, additional cable and other reconstruction of outside plant, all of which necessitates an expenditure of $15,492.86; that the present quarters occupied by the central office are insufficient in size to accommodate the new switchboard and that other quarters have been rented at an increased rental of $20 per month, together with an additional expenditure of $450 for alterations; that it will be necessary to increase the operators' salaries owing to the increased cost of living and the inability to secure operators in Detroit.

The petitioner therefore requests authority to increase its local exchange rates as follows:

PRESENT RATES.

Individual line business	$ 2.00	per	month	
Individual line residence	2.00	"	"	
Two-party line residence	1.75	"	"	
Four-party line residence (with desk set)	1.25	"	"	
Four-party line residence (wall set)	1.00	"	"	
Business extension telephones	1.00	"	"	
Residence extension telephones	.50	"	"	
Extension bells	.25	"	"	
Intercommunicating sets:				
Trunks, each	2.00	"	"	
Stations, each	.75	"	"	
Rural private line residence	1.50	"	"	
Rural residence multi-party	1.00	"	"	
Rural business multi-party	2.00	"	"	
Other line rural station	.25	"	"	
Private line Detroit to White Earth	23.00	"	"	
Employes	Free			
Extension sets thereon	Free			

PROPOSED RATES.

Individual line business	$ 3.00	per	month,	gross
Individual line residence	2.00	"	"	"
Two-party line residence	1.75	"	"	"
Four-party line residence (desk set)	1.50	"	"	"
Four-party line residence (wall set)	1.25	"	"	"
Business or residence extension	.50	"	"	net
Extension bells	.25	"	"	net
Intercommunicating sets:				
Trunks, each	3.00	"	"	gross
Stations, each	.75	"	"	net
Hotel private branch exchanges:				
Trunks, each	3.00	"	"	gross
Stations, each	.35	"	"	net
Rural residence multi-party ($12 per year net if paid yearly in advance.)	1.50	"	"	gross
Rural business multi-party	2.25	"	"	gross
Switching connections for rural companies who operate no switchboard themselves free out connections from all other telephones connected with the exchange, plus $1.50 per month for each circuit having six or less than six instruments and 25 cents per month for each telephone in excess of six.				
Private line service from White Earth United States Government office to city of Detroit	23.00	"	"	net
Employes, residence private line	1.25	"	"	gross
Employes, four-party line	1.00	"	"	"

Other rates and charges to remain as now existing.

All of the above rates to be payable monthly in advance excepting connecting company rurals, which are payable annually in advance, and on all rates quoted gross a discount of twenty-five cents per month will be allowed when paid on or before the fifteenth of the month.

A hearing in the above entitled matter was fixed to take place in the Ctiy Hall at Detroit.

Illinois

For a considerable time there has been a difference of opinion between the twenty-three farmers' lines on the farmers' switchboard in Bushnell and the switchboard of the Western Illinois Telephone Company, operating an exchange there. Efforts at various periods for the past two years have been made to reach an agreement but at all times negotiations failed and in August of last year a hearing was begun before the State Utilities Commission whereby an adjustment could be had.

June 30 the commission wrote an opinion and ordered that reciprocal or free exchange be maintained between the two companies, reaching out to the first terminals or exchange.

The evidence showed that many conditions arose preventing an agreement, the Western demanding certain tolls and the farmers asking for the extension of free use of the wires beyond the immediate territory reached by the farmers' lines.

The commission went into the situation in detail and held that unlimited or indefinite extension of free service by the farmers in connection with the Western would be unjust and contrary to the rulings of the commission in as much as the Western is operating toll lines in the counties which the farmers' territory reached.

Quoting from the ruling of the commission:

It is the opinion of the commission that the physical connection between the exchange of the complainant (Western) and the switchboard of the respondent (farmers) in the city of Bushnell should be maintained and that the handling of calls between the subscribers of the complainant in the city of Bushnell and those subscribers on the twenty-three farmer lines that are connected directly to the switchboard of the defendant in the city of Bushnell shall be on a reciprocal or so-called free basis, and that on all calls from Bushnell to subscribers of the said farmer lines or so-called mutual companies that pass through another switchboard or terminate on lines beyond the direct line terminals of the defendant, a toll charge shall apply, and on all calls originating at points beyond the direct line terminals of the defendant and passing through another switchboard before reaching the switchboard of the defendant in the city of Bushnell, a toll charge shall apply.

It is therefore ordered that the reorganization committee of the Western Illinois Telephone Company and the Farmers' Bushnell Telephone Association shall continue to maintain the physical connection that exists between the exchange of the former and the switchboard of the latter in the city of Bushnell.

It is further ordered that all calls or messages from subscribers of the complainant in the city of Bushnell to those subscribers on the twenty-three farmer lines that are connected directly to the switchboard of the defendant in the city of Bushnell and all calls from those subscribers on the twenty-three farmer lines that are directly connected to the switchboard of the defendant to subscribers of the complainant in the city of Bushnell, shall be on a reciprocal or so-called free basis and that on all calls from subscribers of the complainant in the city of Bushnell to subscribers of farmer line companies or so-called mutual companies that are reached through another switchboard, or are connected on lines beyond the direct line terminals of the defendant, a toll charge shall apply and on all calls originating at points beyond the direct line terminals of the defendant and passing through another switchboard before reaching the switchboard of the defendant in the city of Bushnell, a toll charge shall apply.

Thirty days is deemed a reasonable time within which to comply with this order.

A joint petition was filed with the state public utilities commission by the Galesburg Union Telephone Company and the Central Union Telephone Company asking for authority for the Central Union Company to sell its property at Galesburg to the Galesburg Union Telephone Company and receive in payment $100,000 in common stock and $100,000 in preferred stock of the latter company.

The state utilities commission has granted to the Home Telephone Company of Arenzville, of which John G. Pratt of this city is president, authority to increase its telephone rate. The company has increased its rates for telephone service in Arenzville, effective July 1, as follows: For business telephones, $19.00 per year; residence telephones, $16.00 per year; rural telephones, $16.00. All bills are payable quarterly on or before the 15th day of the second month of the quarter in which the service is rendered and if so paid a discount of 25c per quarter is allowed.

Commissioner Patrick J. Lucey of the state public service commission heard the application of the Sangamon County Telephone Company of Springfield for permission to issue its promissory notes to the amount of $16,000 and its common capital stock to the amount of $14,700.

The attorney-general of Illinois was asked by the Public Utilities Commission to advise it as to whether or not it would be justified in approving the application of the Commonwealth Edison Company for authority to issue the certain capital stock at par to its stockholders, in view of the fact that the market price of said company's outstanding stock was much in excess of par.

The attorney-general advised the commission to approve the application, stating among other things, that since the commission has supervision of the application of the funds received from the proposed sale, neither the public, the investor nor the stockholder has any further concern in the premises. That the consuming and investing public have the right to know that every dollar of stock represents a dollar of investment but there their interest ceases. The consumer is not affected by the sale since his rates and service cannot be disturbed thereby, and the rates being predicated on the value of the actual investment in the property and not upon the par of outstanding securities, must less upon their sale price. The public service cannot be adversely affected by the price of the stock since service depends more upon the use of the funds secured by the utility than upon the particular manner in which such funds are acquired. Indeed, it is possible that service may be impeded by failure to approve the proposed issue, since the utility may thereby be thwarted in its attempt to procure additional capital. The fact that a larger issue is necessary to realize a given sum, when stock is sold at par, should create no hesitancy in the minds of the commissioners, since the commission is not concerned with the dividends to be earned, being interested only in the question of rates as determined by actual investment.

Indiana

The public service commission of Indiana decided on July 28 for the hearing of the petition of the Indianapolis Telephone Company for authority to issue $1,000,000 of five year 6 per cent notes.

In this petition the company sets out that it not only owns and operates the local exchange in the city of Indianapolis, but also has long distance telephone properties whose service extends into thirty-six counties, and also holds the Consolidated Telephone Company, operating in Hendricks county; the Martinsville Telephone Company, a majority of the Lebanon Telephone Company, the Citizens Telephone Company, of Columbus, Ind., and that it controls the Citizens Telephone Company, of Edinburg.

The company further shows that it now has issued and outstanding $1,900,000 of preferred stock and $1,035,000 of common stock; that it has mortgage indebtedness on its property amounting to $1,555,710.90, and that all of this mortgage indebtedness was incurred many years ago. The company, alleges that it expended between May 4, 1916, and May 31, 1917, on additions to its plant, $1,044,404.31. It alleges that only $400,000 of this has been derived from permanent capital accounts, and that this $400,000 was so derived at the time of the merger of the New Long Distance Telephone Company, the New Telephone Company and the Indianapolis Telephone Company. It alleges that the remainder of the money so invested has been provided through its income or through money raised on bills payable issued for short periods to various individuals and institutions.

The company also sets forth that it had on June 1 this year, in process of completion, additions to its plants not yet paid for, other than automatic electric equipment, which will cost to complete approximately $14,844.79. The company also sets forth that it has under order with the Automatic Electric Company additional automatic equipment to be placed within the next eight months, costing approximately $174,414.46. The company also states that it will need to make other additions and extensions to its plant in the immediate future—estimates of

which have been submitted by its engineers—cost approximately $136,520. The company also sets out that it desires to complete the acquisition of the Citizens Telephone Company of Edinburg for which $18,648 is necessary.

These sums, including the stock of the Citizens Telephone Company at Edinburg, total $860,000 and the company desires to raise this amount of money by the sale of five-year 6 per cent notes. The company also sets forth that it believes it advisable to sell an additional quantity of notes, raising the total to $1,000,000 to be used exclusively on capital account.

The petition exhibits reveal that the company has at this time outstanding $525,644.77 in bills payable and held by various banks and companies which would be thus converted into part of the $1,000,000 of notes. The company states that it is not in the interest of sound policy to continue to renew its obligations for short periods under present conditions, and thinks it sound policy to consolidate such indebtedness and care for extensions and betterments in a single issue of notes.

The public service commission is having a valuation of the plant, and an audit of the books made.

The Greencastle Telephone Company, which surrendered its franchise on July 1, has filed a petition with the public service commission, asking for an increase in rates. It asks an increase of 50 cents for business telephones, making that telephone $2.50; and an increase of 25 cents for the resident telephones, making them $1.50. No date has been fixed for the hearing.

The public service commission has denied the petition of the Tipton Telephone Company for an increase in its business and residence service rates. It was asked that the residence rate be increased from $1 to $1.50 and the business rate from $1.50 to $2. The commission's report sets out that the company earned $9,014 net during the year 1916, which is deemed a fair earning on the value of the plant.

The commission figured on a basis of 7 per cent of $75,756, the value of the plant and deducted 4½ per cent for depreciation and $1,000 for taxes. It was shown that after earning $9,014 the company had a surplus of $303.06. The commission suggested that there is an abundance of salaried officers.

Kansas

The Kansas Utilities Commission has ordered the two Sabetha telephone plants combined, but W. W. Finney, purchaser of the two plants is unwilling to accept the terms proposed by the commission. The utilities commission has ordered another inventory of the old Mutual plant in order to check itself on its valuation of the plant.

The commission was willing to grant the $26,000 purchase of the Bell plant, but would not agree to the $38,700 purchase price of the old Mutual plant for purposes of capitalization. Mr. Finney proposed a capitalization of $70,000. This was based on $26,000 for the Bell plant, $38,000 for the Mutual plant and $6,000 expense of putting the plants together. The rates would be based on six per cent interest on the capitalization of $70,000, and six per cent depreciation.

The utilities commission will hold the matter in abeyance until an inventory of the old Mutual plant is made. Then a positive order will be given establishing the capitalization.

Later, after the two plants are combined, another inventory will be taken to establish the rate to be paid by telephone users.

The utilities commission and Mr. Finney agreed on the $26,000 for the Bell plant and on the $6,000 cost of combining the two plants. It was on the $38,000 valuation for the old Mutual plant that the contending sides hung. The utilities commission was willing to allow $30,000 capitalization, totaling in all $62,000 as a capitalization basis.

The next move will be for Mr. Finney to employ an expert to make a physical valuation of the old Mutual plant. This will require about a month. The commission will hear his report and arrive at a finding regarding the Mutual valuation.

In the meantime the two plants will run as heretofore. After the question of capitalization is settled the telephone companies will have six months in which to effect the consolidation.

Kentucky

The Ghent Telephone Exchange Company has filed a complaint with the State Railroad Commission against the Central Home Telephone Company, of Louisville, the Carrollton Telephone Exchange Company and the Independent Long Distance Telephone and Telegraph Company, alleging that for long distance service to people who are not its subscribers, its lines are used under contract with the Independent Long Distance Company, and it is not allowed any compensation. It demands that it be paid its proportion of the tolls.

Massachusetts

The Public Service Commission has ordered the New England Telephone and Telegraph Company to make a change in its rate schedule as a result of which subscribers in the Assonet, Fiskdale, Magnolia and Windsor exchanges will be able, by paying the regular rates for the Fall River, Southbridge, Manchester and Dalton exchanges, respectively, to get unlimited service in those exchanges as well as in their own. Such subscribers will also be permitted to contract for single-party or two-party line service. At present they are restricted to six-party and fifteen-party lines.

Nebraska

Telephone companies in Nebraska that are paying more than 7 per cent in dividends will be interested in a ruling made by the State Railway Commission in the Hartington case, which in effect means that dividends for more than that amount will be looked upon with disfavor by the commission.

The commission orders the Hartington company to invest all its earning above 7 per cent in extensions and betterments.

New York

"Perhaps another month," was the word given out the middle of July by the Public Service Commission regarding definite arrangements for installing the public telephone service in rapid transit stations—a convenience for which the public has been waiting more than two years. Assurances were given a month ago that everything had been arranged and installation of the telephones only awaited signing the contracts. Now it is announced that the negotiations have not been finished.

While the officials involved insist there has been no quibble over rates, it was learned that still another tentative contract must be drafted before the work will begin. The contract will be signed by the New York Telephone Company and the Interborough and Brooklyn Rapid Transit companies, operating all subway and elevated lines in Manhattan, the Bronx and Brooklyn. It already has been agreed to put in the booths in every station. The telephone company has been ready to begin the work and has completed its surveys of station conditions.

"Another contract must be drawn up," Le Roy T. Harkness, in charge of the Rapid Transit Bureau of the Public Service Commission, said. He has been in charge of the negotiations for the public, and has been acting as arbiter. The contracts will state the division of the income of the booths between the telephone and rapid transit companies.

Ohio

The Citizens' Telephone Company of Delaware was authorized by the public utilities commission to purchase the exchanges of Delaware County Telephone Co. The price to be paid is $13,200.

According to the opinion of C. A. Radcliff, attorney of the Public Utilities Commission of Ohio, the Elyria Telephone Company is morally, but not legally, bound to refund to subscribers, who have been charged an extra twenty-five cent fee for the use of the extension desk phones, the excess amount of their bills since January 1, 1916. Mr. Radcliff says: "It is safe to say that those charges should be refunded by the company." He then goes on to explain that the commission has the power to fix rates but that there is nothing in the law that gives the commission authority to make an order requiring the telephone company to refund any of the charges collected between January 1, 1916, and the time the collection of such charges ceased.

"The commission has power to afford complete relief in the matter of the future excessive or illegal charges, but has no power to order payment of charges collected in the past."

A test case may be made of some subscriber who has a refund due him and that will settle the matter for all such cases.

The purchase of the property of the Willoughby Telephone Company at $22,600 by the Central Union Telephone Company and the sale of the latter company's property at Chillicothe, Bournville and Richmondale to the Home Telephone Company of Chillicothe for $41,000 par value stock in the Home company, was authorized by Common Pleas Judge Tarbell. The transfers must also be authorized by the utilities commission.

The Ada Telephone Exchange Company, of Ada, asked the state utilities commission, at Columbus, for the authority to purchase the establishment of the Dunkirk Mutual Company at Dunkirk. The price named in the petition was $7,000.

There are at present two telephone exchanges in Dunkirk, both of which are located in the same block. One is the Mutual Company and the other is controlled by the Ada exchange company. With the two lines in Dunkirk some people have one telephone and others the other. In combining the two companies there would be only one line. This would establish a union of telephones in the village.

Oregon

Under a plan submitted to the Public Service Commission by Oswald West, receiver for the Home Telephone Company, and Richard A. Montague, attorney, that company offers to all new subscribers who install Home telephones three months' service free. The tariff filed also includes the old provision that after the first three months free the charges shall be $2.25 per month, with 25 cents cut off if bills are paid before the tenth of the month.

Oklahoma

Ordering the Kiamichi Valley Telephone Company to install party line service to the town of Albion in connection with the switch board at Talihina, the corporation commission disposed of the controversy between the company and Albion.

Utah

Questioning the right of the Mountain States Telegraph & Telephone Company to change the number of a subscriber without consent of the subscriber, the Citizens' Coal Company, the Central Coal & Coke Company and the Federal Coal Company have filed a complaint with the state public utilities commission, seeking the restoration of their old numbers.

It is charged by the complainants that their prefixes were changed from "Main" to "Wasatch," and that their numbers, consisting of two numerals, have been changed to numbers consisting of four figures, much to the annoyance and inconvenience of themselves and their patrons. Discrimination is also charged, in that, while their own prefixes and numbers have been changed, the Bamberger Coal company has been permitted to retain its old number of "Main 2."

The Mountain States Telegraph & Telephone Company has filed an answer quoting the following from the rules and regulations published in its directory: "The subscriber has no property right in the telephone number, or any right to continuance of service through any certain exchange, and the company may change the telephone number of the exchange through which connections are made whenever it deems it necessary in the conduct of its business."

This is said to be the first case that has ever been brought before a utilities commission, questioning the right of a telephone company to adopt arbitrary rules and regulations.

Washington

In compliance with a motion by the city of Spokane made at a recent hearing, the state public service commission dismissed the old rate case filed by the city against the Pacific Telephone Company. This case was afterward superseded by an action as to rate regulation, begun by the commission on its own initiative and ended in 1916.

This action still leaves pending before the public service commission the petition signed by twenty-six Spokane business men asking that the rates of the Home Telephone Company of Spokane be investigated and their reasonableness determined.

Corporation Counsel J. M. Geraghty filed a letter with the city council inquiring as to the desires of the city

in intervening in the Home rate case. He suggests that the city intervene to show that the Home rate case is not a bona fide proceeding, but was begun at the suggestion of the telephone company, which circulated the petition. He would ask the commission to dismiss the case as having no real merit and being filed solely for the purpose of dragging the public service commission into a franchise controversy between the city and the Home Telephone Company.

Central Indiana Men Meet

Seventy-five members of the Central Indiana Independent Telephone Owners' Association met in their annual session July 17, in the Chamber of Commerce rooms at Columbus, Ind. An interesting and instructive program was given.

The program began about 10:30 o'clock with a welcoming address by Mayor H. K. Volland who, in a short speech, presented the key of the city. The response was made by Jesse Weik, president of the Greencastle Telephone Company. Following this came a talk on "Telephone Transmission Problems," by H. M. Friendly, of the Indianapolis Telephone Company. The morning program closed with a talk by William D. Bailey, manager of the Home Telephone Company of Richmond, on "Concrete Pole Construction." The meeting was presided over by Max E. Hosea of Indianapolis.

At noon the members of the association gathered on the steps of the postoffice where a group picture was taken. Luncheon was served by the ladies of the Methodist church in the church annex at 12:30 o'clock. Following luncheon, the members went to the local telephone exchange and inspected the plant.

The afternoon session began promptly at 2 o'clock with a talk on "The Increased Cost of Operating the Telephone System," by George Watts, of the Knightstown Telephone Company. This was followed by a talk on "Cost of the Central Office Fire," by C. R. Blearney, of the Morrison Telephone Company of Greenfield. Next came "Going Value," by J. K. Johnston, telephone engineer of Indianapolis. C. E. Doolittle, of the telephone company at Terre Haute, followed with a talk on "Long Distance Operating," and afterward came a talk on "Construction," by V. E. Furnace of Louisville, Ky. "Maintenance of the Switch Boards," by E. P. Shafer of Indianapolis, came next. Following this a talk was given on "The Installation of Switch Boards," by W. H. Hogue of the Leich Electric Company of Indianapolis, and the program closed with a talk by Belden Blake of Indianapolis on "Long Distance Cord Circuits."

A short business session was scheduled for the afternoon when officers were elected and the place of the next meeting chosen.

J. A. Brown, president of the Winchester Telephone Company, was elected president of the Central Indiana Independent Telephone Owners' Association. Max F. Hosea, traffic manager of the Indianapolis Telephone Company, was elected secretary-treasurer. The next meeting will be held at Winchester.

The following are the sixty-seven who registered for the meeting:

L. H. Shackley, North Vernon; William Pogue, Danville; O. W. Horne, Noblesville; E. Hawkins, Noblesville; O. M. Martz, Arcadia; Charles Preston, Martinsville; J. L. Staht, Indianapolis; George H. Davis, Rushville; B. L. Stratton, Cambridge City; M. V. Spinney, Rushville; H. F. Friendly, Indianapolis; M. F. Hosea, Indianapolis; C. B. Cornelius, Bargersville; S. S. Wilson, Cleveland, O.; George Camp, Rushville; T. O. Nelson, Brownsburg; Ira Trout, Arcadia; E. E. Hain, Liberty; L. W. Hogue, Geneva, Ill.; Harry Dorrel, Hope; Charles Bell, Hope; E. D. Allen, Pendleton; R. F. Scudder, Rushville; Charles Kingan, Edinburg; R. E. Brookbank, Pendleton; G. W. Dorrel, Hope; Charles Perry, Whiteland; Otto White, North Vernon; E. E. Boone, Whiteland; Eustice Pile, Marietta; C. E. White, Carthage; J. L. Hosea, Columbus; J. C. Teaford, Union City; Ora Brooker, Fairland; Clifford Robbins, Winchester; E. C. Clark, Lynn; J. W. Watt, Greencastle; W. L. Edson, Noblesville; Herbert Whitsel, Lapel; M. L. Clouser, Thorntown; H. P. Marsh, Shirley; I. K. Johnson, Indianapolis; P. E. Harbold, Indianapolis; E. A. Tull, Lapel; I. D. Daubenspeck, Carmel; C. E. Doolittle, Terre Haute; J. M. Houston, Knightstown; W. D. Bailey, Richmond; W. H. Pearl, Chicago, Ill.; Karl B. Davis, Middletown; J. H. York, Morristown; Howe H. Davis, Middletown; B. C. Wickersham, Tipton; J. M. Stanley, Ladoga; C. L. Elder, Indianapolis; J. W. Robertson, Waveland; S. O. Davis, Franklin; J. E. Harrod, Flatrock; I. M. Heath, Chesterfield; J. W. Hampman, Indianapolis; E. N. Milhaus, Mooresville; G. Boos, Batesville; W. H. Ader, New Maysville; W. A. Ford, Roachdale; George South, Batesville; L. C. Griffith and H. H. Carter, Seymour.

Promotion Plan for Employes

Realizing that its plant department, which seldom comes in contact with the public, as compared with the office force and the operators, must be kept in a high state of efficiency because their services are the basis of the service given the community at large, the Pacific Telephone & Telegraph Company has recently inaugurated a "plan for examination for promotion and increased compensation for plant department employes." In explanation of this plan a local manager says:

"This plan provides for detailed but practical examinations to be conducted under the direction of examiners chosen from plant supervisory forces such as district superintendents, wire chiefs and foremen. All employes are eligible who can show a preliminary service of one year. No deductions are made in the compensation of applicants for time required by examinations, and even the cost of transportation is allowed to and from the places where such examinations are held. The wages and standing of applicants not passing are not affected, and liberal privileges as to further examinations are provided for. In general, examination questions are directed to the effect to ascertain the abilities of the applicant bearing upon his particular knowledge of the work in which he has been employed, his familiarity with other lines of telephone work associated with his own, his knowledge of "safety first" measures and rules, and of public regulations applicable to construction and his responsibilities in his particular territory.

"A utility is as eager to obtain competent men for its responsible positions as are its employes for 'the job ahead,' and the telephone company is endeavoring, in this fair and equitable manner, to find those who are deserving of promotion.

"The company has met with a gratifying response from its employes, many of whom have already presented themselves for examination. The company management realizes that the increased efficiency of the individual in its ranks means added success in its operations. For the public it is a guaranty of a plant well established and maintained, in other words, prompt and dependable telephone service."

Of Interest to the Trade

What the Telephone and Accessory Manufacturers Are Doing to Advance the Art

Automatic for Mutual at Erie, Pa.

The fifth city in Pennsylvania, Erie, has grown phenomenally during last years and has become a very important industrial center. Partly through this growth in population and activities, partly through the increasing importance of telephone service in daily life, and partly because of the policy of the company, the Mutual Telephone Company's system has grown almost six times as fast as the city, and it was largely this fact that turned the attention of the company's officials seriously to the question of making additional provisions for the future. A very conservative estimate shows that facilities for a minimum of 20,000 telephones must be available during the next 10 years and an even more probable figure is 25,000.

When, in 1917, the Mutual Telephone Company installed its present manual equipment, it seemed certain that it would wear out before it would be outgrown. Practically rebuilt recently and equipped with the latest mechanical features of manual construction, this switchboard is still far from being actually worn out, but a short time ago it became apparent that crowd the present board as they might, use it to its full capacity, not more than two years would elapse before it would be imperative to supplement it by establishing a number of branch exchanges.

In the opinion of the directors, such a course had in it two very serious disadvantages. In the first place they felt that it would greatly interfere with the quality of service rendered, making it slower, because of the necessity of employing two operators for a large number of calls, instead of one, and for the same reason, adding substantially to the percentage of operators' errors. This would effect the subscribers primarily, but they realized that it would also reflect back upon the company by causing annoyances which would mar the present cordial relations existing between it and the public.

The second great objection to attempting to cope with the situation by extending the manual system was found by the company's officials in the very substantial increase that would be inevitable in operating expenses. Through a most careful study of efficiency methods, and by cutting off all avoidable waste, the company has been able to balance the increasing wage scale during the past ten years, but the future held out no such prospects. Unavoidable increases, made greater by the growth of the system, would inevitably be encountered, and they foresaw but two alternatives remained if the manual system was retained—smaller profits or higher rates.

Add to this the growing difficulty they are experiencing in obtaining and retaining switchboard operators, and the undesirability of extending the manual system becomes clearly apparent. In other words, the Mutual Company, as have so many other companies, had come to that point in its career when more manual business would mean smaller profits, but to stand still would, of course, be ruinous.

To turn to the automatic as the solution, the directors felt, was the logical step, and they did this with the more assurance, since they had already had some experience with the products of Automatic Electric Company. Some three years ago they installed a 200-line automatic traffic distributor in which they grouped certain especially heavy users and thus spread the extraordinary load over all the switchboard positions. They had also observed the operation of the private automatic exchange, several of them having been installed in the premises of Erie institutions. And more recently, a semi-automatic exchange, utilizing a large part of the automatic principle, has been placed in operation in Wesleyville, a suburb of Erie.

The essential merits of automatic equipment, its soundness of design and general reliability were, therefore, well understood by the Mutual Company's officials. But in view of the importance of the step and the considerable investment involved, they felt that a thorough investigation should be made and definite information obtained upon several points. Among these was the cost of operation and the attitude of the public toward the service rendered by the dial.

With this in mind, several of the officials made trips to exchanges operating the automatic equipment, including Minneapolis and St. Paul, Muskegon, Grand Rapids, Columbus, Alliance and Newark, while letters asking for specific information were sent to a number of other companies.

Wherever possible the users of automatic service were interviewed, the cost and trouble records inspected, and all data bearing on the subject was gathered and given close study. Invariably the same reports were obtained. Everywhere the subscribers were loud in their praise of the girlless service; in each case the operating company testified to the economy and reliability of the automatic system.

Considering it from every possible angle, the directors found that the automatic fitted into the needs of the Mutual Telephone Company and met its most pressing and perplexing problems. It avoided the operators difficulty by eliminating them; it insured constant and moderate operating costs; it gave unlimited scope to the growth of the company's system; it offered better service than the company had been giving—not poorer, as would have been unavoidable with an enlarged manual plant.

From the beginning, the Mutual Telephone Company has been an Erie enterprise, and the men who have guided and directed its affairs have been closely identified with the commercial, industrial and public activities of that city. President A. A. Culbertson has been engaged in the wholesale coal business for many years and is also connected with the Northwestern Pennsylvania Railway Company and the Northwestern Electric Service Company of Pennsylvania.

William Spencer, vice president of the Mutual Telephone Company, is president of the First National Bank of Erie, one of the oldest financial institutions in that part of the sttae. A. W. Hayes, on the death of his father, who was for many years treasurer and a director of the company, succeeded him to that office. He is also the proprietor of a large wall paper establishment in Erie.

In addition to the above officers, the board of directors includes F. R. Simmons, head of a large and long-established produce and cold storage business, and the Hon. William J. Stern, an ex-mayor of Erie, who gave the city one of the best and cleanest administrations in

its history, and is now the active and energetic secretary of the Board of Commerce.

John Z. Miller, secretary and general manager, has been in active charge of the company's operations since its founding in 1897. Graduating as an electrical engineer from Lehigh University in 1891, Mr. Miller became superintendent and engineer with one of the pioneer independent telephone manufacturing companies at Baltimore. He has also been active as an inventor and has taken out a number of patents on telephone devices, among which are a selective signaling apparatus, an automatic calling device, several patents on telephone transmitters, a generator cut-off, a direct current receiver, etc. In 1901 a multiple switchboard was built by the Mutual Telephone Company and installed under his patents.

Besides managing the Mutual system, Mr. Miller is acting as receiver of the Union Telephone Company of Erie, which operates long distance lines in Northeastern Pennsylvania, Southwestern New York and Eastern Ohio.

Prompt Shipments

Prompt shipments are always demanded. Many telephone companies often find that they are in immediate need of supplies, and feel at ease when they know their

St. Paul
Chicago, Ill.
Permit No. 1151
Reliable Prompt Sales Service That You Can Depend On - Today - Tomorrow - Every Day
The Kellogg Company, a Permanent Institution for Independent Telephony

The "Prompt Shipments" Booklet.

orders will receive immediate attention, and can be expected at the earliest moment.

The Kellogg Company have an unequalled record for prompt shipments.

Every order that is received is given individual attention, and systematically followed through, so that it is placed on an express or freight car in the earliest possible time.

The cover of the Kellogg Company's new apparatus folder "Prompt Shipments" portrays this feature of Kellogg service. An order received is accurately and quickly filled, checked, and delivered to where the railroad company checks the shipment before rushing it out.

This folder illustrates Kellogg telephone and switchboard equipment, which is being standardized by the largest Independent telephone companies of today.

The folder is illustrated with thirty striking line drawings, showing the apparatus to the best advantage.

Each piece of apparatus is briefly described and priced.

The Kellogg Company will gladly send a copy on request.

The New York Telephone Company has increased its capital from $150,000,000 to $200,000,000.

Kellogg's Red Cross Records

The Kellogg Switchboard and Supply Company of Chicago, has just received a letter from William H. Rankin, general chairman of the American Red Cross, complimenting it upon the list of subscriptions it sent in, and the manner in which the names were arranged. The letter is as folows:

"It gives me a great deal of pleasure to go over your splendid list of subscriptions to the American Red Cross. Of all the lists I have seen, yours was gotten up in the most complete style, and you cannot imagine how much that helps the men and women who have had the hard work of trying to decipher the penmanship in acknowledging subscriptions for memberships to the Red Cross.

"I am going to take the liberty of sending the carbon of the list which you so kindly forwarded to me to H. J. Hill, director of the national membership campaign at Washington, with the suggestion that the manner in which you handled your report is what I would call ideal.

"Thank you most sincerely, not only for sending me the list, but for the splendid work which the Kellogg Switchboard & Supply Company has done in co-operating with the membership campaign in the City of Chicago. We have gone well over 300,000. We started out to get 150,000, but it is work like you men and women have done that has made it possible for Chicago to lead the world as a Red Cross city.

"With kind regards and sincere appreciation of your work, I am, etc."

Indiana Convention September 19

A complete operators' school will be held in connection with the annual convention of the Indiana Independent Telephone Association at the Claypool Hotel, Indianapolis, September 19 and 20.

Instruction will be given in both local and long distance work. The time will be divided, certain hours being devoted to local operating and others to long distance operating.

W. S. Vivian, secretary of the United States Independent Telephone Association, will have charge of the school and will be ably assisted by F. V. Newman, secretary of the Michigan Independent Telephone and Traffic Association.

Messrs. Vivian and Newman are now working out a complete program. Each operator attending will be supplied with suitable memorandum pad whereon she can make notes of the several questions that will be given her and the answers thereto. In fact, two written examinations will be given, one on local work and one on long distance work. The written examination, of course, will be supplemented by a verbal discussion and by the use of a blackboard, together with switchboards and Mr. Newman's lantern and slides.

Preparations are being made to make this the biggest and best operators' school ever held in the State of Indiana and all companies are urged to send as many of their operators as possible to attend.

The time and expense in connection with a thing of this kind is incidental when compared with the good results to be obtained.

The tax of $1 on telephone poles of the Interstate Independent Telephone and Telegraph Company imposed by Springfield, has been declared valid by the Illinois Supreme Court.

New Kellogg Advertising Slides

In response to the demand for new advertising slides and printing plates that will show in a graphic way the great need for higher rates because of the vast increase in the cost of everything that the exchange manager has to buy, the Kellogg Switchboard and Supply Company has issued, and is now distributing, a set of eight new slides, some of which are reproduced in the accompanying illustrations.

"TELEPHONE FACTS"
AN UP TO DATE EXCHANGE THAT CAN GIVE YOU THE SERVICE YOU WANT. IT MUST HAVE GOOD EQUIPMENT
WHAT LOW RATES DO FOR A TELEPHONE COMPANY! NEGLEGTED LINE CONSTRUCTION. DISREPUTABLE SERVICE IS SURE WITH SNARLED, WORN OUT WIRES THAT YOU SEE HERE
Blank Space for Name

"TELEPHONE FACTS"
$250 LOAD OF BEST QUALITY B.B. TELEPHONE WIRE WHEN PRESENT TELEPHONE RATES WERE ESTABLISHED
AVERAGE $250 JAG OF TELEPHONE WIRE PURCHASED DURING PAST YEAR NO PROSPECT OF REDUCTION THIS WIRE INFERIOR AS REGARDS DURABILITY.
Blank Space for Name

Speaking with lips at mouthpiece brings you up to the distant party at the rate of 120 miles per inch of reduced air gap.
Blank Space for Name

"TELEPHONE FACTS"
Dry Batteries are "Telephone Fuel"
ONE BARREL OF 125 NO. 6 DRY BATTERIES
FORMER COST $13.00
ONE KEG OF 50 NO. 6 DRY BATTERIES
AVERAGE COST PAST YEAR $13.00
THE KEG OF BATTERIES SHOWN ABOVE GIVE ONLY ONE THIRD AS MUCH TELEPHONE SERVICE AS THE BARREL OF BATTERIES AT THE SAME COST, WHEN PRESENT TELEPHONE RATES WERE MADE.
Blank Space for Name

Some of the Kellogg Slides.

They are, indeed, "Telephone Facts" with a vengeance.

Two of them show graphically the need of constant upkeep and repairs in any telephone system necessary to give satisfactory service.

Three of the slides show by means of comparative illustrations and clear, short, terse sentences, the means of giving present day service with the material to be obtained. Two of them are additions to the Kellogg Company's extensive line of advertising service plates, illustrating in a graphic manner the way of correct telephone usage.

These plates are being sent out under the same arrangement as all of Kellogg advertising service.

In this connection the fact may be mentioned that the Kellogg Company was the first to provide the operating man with helpful service advertising. About 1902, or earlier, the first Kellogg "Way to Talk" plates were distributed, and these showed in graphic comparison, both with photographs and line drawings, the correct and the incorrect way to handle a telephone. The original idea has been remade from time to time to keep pace with improved apparatus.

In those days there were, figuratively speaking, but a handful of telephones in service throughout the country and, naturally, people did not know how to use them. Today, however, with a telephone in every store and office, there are still people who either do not know how to telephone properly, or do so in a careless way. Furthermore, there is the yearly crop of youngsters who "telephone to daddy" for the first time. They must be taught by illustrations as soon as they can read pictures, and that is considerably earlier than when they can read printed notices.

Even before the "Way to Talk" plates, the Kellogg Company's publicity was an educational service, not only for the man at the head of the exchange, but for his subscribers.

Today the Kellogg Switchboard & Supply Company is said to be foremost in the field in the matter of helpful advertising service for the Independent telephone man. At great expense it has collected, and is continually increasing, its altogether original line of advertising plates, covering all the past needs of the Independent manager and new ones as they arise.

The Kellogg Company has borne the expense of this original work, never charging except for the actual cost of electrotypes, more as a matter of record than anything else.

Even though the telephone manager may not care for new subscribers at this time he should start, or continue, an advertising campaign, to teach his patrons the proper usage of the telephone, to make them appreciate the difference between good service and bad, to acquaint them with his problems and prepare the way for the rate increase which the company may need. There is no better medium for such publicity than the local picture show, and these new slides will help.

The Kellogg line of illustrations and its advertising bulletins are invariably original. The company is a leader in the production of contract making, advertising and publicity plates, and complete campaigns for the Independent telephone exchange. It is also energetic in pushing the operating value of Kellogg apparatus itself.

No Pioneer Convention

The imperative calls and necessities of the war in which the nation is now involved have taken many telephone men from their regular vocational duties; and it is more than probable that during the months to come many more may similarly be called away.

In these circumstances and under such conditions, it has seem to the executive committee of the Telephone Pioneers of America, which has devoted much care and thought to the subject, and has conferred with officers of the American Telephone and Telegraph Company and associated companies, that it is inexpedient at present, or in the immediate future, to hold the usual annual and general meeting; and it has accordingly been decided by the committee that the meeting be postponed, pending the development of more favorable conditions.

Telephone Repairers Are Busy

Just about ten months ago—the twenty-third of October, 1916, to be exact—the Standard Telephone Repair Company opened a one-room office, with one man in it, at 160 North Fifth avenue, Chicago. Under the energetic guidance of J. Skinderviken, who is so well known in the rebuilt telephone trade, the growth of the company has been remarkable. Today it has fourteen employes, and its suite of six rooms is not large enough.

Mr. Skinderviken—or his company rather—is doing a large amount of telephone repair work, especially for the large telephone operating companies.

Telegraph Line Dispute

The War Department authorizes the following:

The discussion between the Louisville & Nashville Railway Company and the Western Union Telegraph Company as to the rights of the latter corporation to maintain its line along the right of way of the road has been taken in hand by the secretary of war, who has seen that the contest was working toward a crisis which might interfere with necessary government operations. Recently the railway officials, acting within what they interpreted as their legal rights, announced that they would not tolerate the encroachments of the telegraph company's equipment along their tracks. As the case approached the point of deadlock it was understood that the road officials had given orders to gangs of their workmen to arm themselves with axes and remove the telegraph company's property by the simplest possible method—chopping down the poles.

The secretary of war at once realized how grave a complication for the government might arise out of the argument. Accordingly he dispatched a message to the heads of the two concerns informing them that they would be expected to meet together at once and come to a peaceable and prompt agreement. Otherwise, he intimated, the telegraph line under discussion would be taken over and operated by the government in such a way as to make private interference impossible.

Lord Northcliffe Uses Transcontinental

Lord Northcliffe delivered a brief address July 12 to the people of the Pacific Coast from the directors' room of the American Telephone and Telegraph Company, 195 Broadway, New York. He was the guest of Theodore N. Vail, president of the company. A party of English army officers and several women also attended the demonstration of the long-distance telephone.

To a San Francisco representative of the company Lord Northcliffe gave the following message, requesting that it be relayed to the newspapers of the Pacific Coast:

"When I last visited California I found that you had in your beautiful city a great number of English and Scotch residents. I suggest that they get together at once and organize for recruiting. I also urge that they strictly observe the food regulations set forth by Washington."

The party then listened to "God Save the King" and "The Star Spangled Banner," played in San Francisco, and also heard the roar of the Atlantic and Pacific surf at the same time. Lord Northcliffe was extremely impressed by the demonstration.

Chicago Publicity Man Dies

Roy V. Johnson, thirty-four, Chicago Telephone publicity man, died after a short illness at his home, 6830 Sheridan road, Chicago. He was born at Miamisburg, O., and for several years worked on newspapers in Dayton. He came to Chicago eight years ago and worked on the *Chicago Examiner* and the *Inter-Ocean*. Four years ago he joined the publicity department of the Chicago Telephone Company as copy manager. He was well known in the newspaper fraternity of Chicago and was a member of the Advertising Club of Chicago and the Electric Club-Jovian League. His widow survives him. The funeral was held in Miamisburg.

Convenient Battery Cell Tester

The *Engineer* thus describes a convenient little battery cell tester for use in field telephone work. The device consists of a small flat pocket box with compass galvanometer, buzzer, and three-contact slide switch. The galvanometer shows the condition of the cell and the direction of the current. By means of the buzzer the strength of the cell can be tested. Putting on the buzzer by the switch produces a loud humming sound if the cell is in perfectly good order. Should the buzzer give no sound the cell is to be condemned as useless. It takes but a few seconds to test a cell.

C. E. Heston Joins Signal Corps

Charles E. Heston, formerly manager of the Rochester sales department of the Stromberg-Carlson Telephone Manufacturing Company, has been awarded a captain's commission in the U. S. Signal Corps Reserve and has been called for active service.

Signal corps work is not entirely new to Captain Heston as for a number of years previous to his employment by the Stromberg-Carlson Company he was connected with the engineering department of that branch of our service and fulfilled many important assignments both in this country and its possessions. For the past

Captain C. E. Heston.

three years he specialized on sales of apparatus to the government and was in a position to become thoroughly familiar with the development and manufacture of military telephone equipment.

Captain Heston takes with him the best wishes of the Stromberg-Carlson organization and of many other friends and acquaintances in the Independent telephone field.

War Service Dependents

The Western Electric Company, through its president, H. B. Thayer, issues this statement:

It is expected that the United States Government will make provision for the dependent families of its soldiers and sailors, but such action has not yet been taken, and some employes of the company who have dependents have been called into military and naval service and others will doubtless be called soon, and their pay from the government will not be sufficient for the support of such dependents.

Pending action by the United States Government, this company will provide temporary financial aid to dependents of employes who, with leave of absence from the company for that purpose, either voluntarily or involuntarily have entered or do hereafter enter the military or naval service of the United States during the continuance of the present war, such aid to be subject to the following regulations:

The Employes' Benefit Fund Committee is authorized to make allowances to dependents of such employes in such amounts and for such periods as it may determine, according to the merits of each case and with due regard to the ability of such dependents to wholly or partially support themselves.

No allowances will be made to dependents of any employes while such employes are receiving full or part pay from the company.

These regulations are to provide for the exigencies of the situation pending a more permanent plan which it is expected will be provided by the nation or through a national fund, and all payments provided by these regulations may be terminated at any time at the option of the company.

All payments under these regulations will be charged to the expenses of the company and not against the Employes' Benefit Fund.

Portland Reorganization

An issue of stock by a new company to succeed the Home Telephone and Telegraph Company of Portland, Ore., and exchange of such stock for mortgage bonds held against the property, is the essence of a plan of reorganization assented to by practically all of the security and shareholders of the corporation which is now in receivership. Oswald West, the receiver, made this announcement on his return from Los Angeles where he went to confer with bondholders.

The new stock issue, which will represent the entire bonded indebtedness of the Home Telephone and Telegraph Company, amounting to $3,000,000, will, it is proposed, take the place of the certificate of indebtedness, and the exchange of stock for bonds will be on a basis of dollar for dollar. By reason of the wide diversity of ownership of bonds no person and no single interest will control the stock taken in exchange for the bonds.

Through the reorganization process the old company's issue of $2,650,000 of stock will become entirely wiped out and no stock will replace it. Samuel Hill, who forced the receivership to collect on a past due note of $50,000, owns the control of the old stock issue. He assents to the proposed reorganization on the terms outlined. Hill formerly was president of the company.

Receiver West states that organization of the new company will proceed at once, and with it a campaign to extend the service at lower rates, made possible by the method which will eliminate the fixed charge of interest on bonds, a heavy burden in calculating operating expenses and cost of doing business.

Flood Lighting

Visiting representatives of the Allies are amazed to see American plants protected, not by darkness, but by floods of light. In Europe the danger lies overhead; in America safety lies in detecting the approach of spies or anarchists. The important industrial and public service plants have been making use of flood lighting for turning night into day and making the stealthy approach of an enemy impossible. The Crouse-Hinds Company of Syracuse, N. Y., is supplying flood light projectors in large numbers, and its new Imperial Flood Light Projector Bulletin No. 303 lists, besides its established line, 1000-watt projectors for both marine and land use. It also contains valuable and interesting statistics on the flood light question. Copies of the bulletin will be mailed free on request.

The Leeds & Northrup Company of Philadelphia has joined the increasing ranks of those who believe in giving their staff a vacation en masse. The plant will be closed from August 6 to 18. The company's new factory addition, which will double its floor space, is nearly completed, and it extends an invitation to all in the trade to inspect the plant when in Philadelphia.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES.

J. H. Prior, formerly chief engineer, Illinois Public Utilities Commission, has left the service of the Illinois Commission to open an engineering office in Chicago.

Rollo R. Stevens, for the past two years general commercial superintendent of the Ohio State Telephone Company, has assumed his new duties as commercial superintendent of the Tri-State Telephone Company, succeeding D. M. Neill, resigned. Mr. Stevens' rise in the telephone world began in Columbus, Ohio, thirteen years ago as a telephone salesman. From this starting point he worked up, reaching in ten years the position of commercial superintendent for the state.

George G. G. Hall of Louisville, Indiana, has been made general manager of the Southern Telephone Company of Indiana, with headquarters in Evansville.

J. Evans, of Oak Park, Illinois, inspector of Chicago Telephone Company, was killed when his auto was struck by an interurban at Aurora.

Walter Matteson, manager of the Mayville, Wisconsin, telephone exchange for the past three years, has been promoted to the Oconomowoc exchange, where he will have charge of one of the best offices in the state. Mr. Matteson is a former Delavan man, and was connected with the Delavan exchange for several years, which resulted in a promotion to the Mayville office for his efficient work. At Oconomowoc he will have a still more responsible position with a larger number of employees under his care.

John Magill has been appointed assistant superintendent of line construction of the Fowler Independent Telephone Company of California .

Col. W. T. Williamson, division manager of the Chesapeake & Potomac Telephone Company, of West Virginia, has announced a number of important changes in his official staff. H. D. Reese, who was formerly special agent on the division manager's staff at Charleston, has been transferred to Clarksburg as district manager. R. F. McAdams, local manager, Clarksburg, has been transferred to Huntington as local manager. On account of the Charleston and Huntington districts being consolidated, Mr. Harry K. Roberts, district manager of the Huntington district, has been transferred to the staff of the division manager, in charge of special important work. C. M. Boren, district manager at Charleston, will have charge of the new consolidated district, with headquarters at Charleston, reporting direct to Division Manager Williamson. F. K. Mansfield, formerly division salesman of the Pittsburgh division, has been transferred to the staff of the division manager, Charleston, as special agent, in charge of connecting company work. Mr. Mansfield has been selected for this important position on account of his special ability for this class of work.

M. J. Vernon, who has been manager of the Sturgis telephone exchange of the Nebraska Telephone Company, has gone to Rapid City, Michigan, and taken charge of the exchange. He has been in charge of the company's interests at Sturgis for some time and is one of their best men in this territory. C. F. Knudsen, who has been in charge of the work at Sturgis for the past year, coming from Spearfish, where he was in the employ of the company, has decided to enter other work and so has severed his connection with the company. Mr. Knudsen at the present time does not know whether his new work will keep him in Rapid City or whether he will be out of the city.

Announcement has been made at the office of the Southwestern Telegraph & Telephone Company, at Brownsville, Texas, of the appointment of W. R. Bateman, recently of the Rockport telephone exchange, to be manager of the Brownsville exchange, succeeding Gerald Johnson, who recently accepted a commission as first lieutenant in the reserve signal corps, and expects to leave in a day or two for Leon Springs to take a course in army routine. Mr. Bateman's assignment to the Brownsville exchange is a distinct promotion for him, and a recognition of his experience and ability as a telephone man, in which business he has been engaged many years in Louisiana and Texas.

At a meeting of the directors of the Hamilton Home Telephone Company, of Ohio, the resignation of Frank Binkley, manager of the company, was submitted and after the reading accepted with much regret for the loss of Mr. Binkley, whose capacity as a manager was highly appreciated. He has been the manager of the company for seven years. The directors sought to retain Mr. Binkley, but another and more attractive proposition caused him to insist on his resignation.

C. E. Roosa has accepted the position of manager of Fayette Telephone Company, of Ohio, where Fred Perry moves to Wauseon to fill the office of treasurer of Fulton County.

A. J. Becht, manager of the Kilgour estate, at Cincinnati, Ohio, was elected to the directorate of the Cincinnati and Suburban Bell Telephone Company, succeeding J. V. B. Scarborough, who resigned because of ill health.

Paul Reed, for the last five years manager for the Southwestern Telephone Company at Gainesville, Texas, has resigned his position to accept service with the Southern Pacific Railway Company at El Paso as manager of that road's telephone system, which is used for the dispatching of trains.

C. J. Queen, former manager of the Ohio State Telephone Company at Akron, has been appointed auditor for the entire system with headquarters at Columbus. He succeeds LeRoy Parker, who recently resigned to take charge of a general utility accounting business. Mr. Queen has been identified with the Independent telephone business since 1903. He will bring his family to Columbus from Akron within a few weeks.

Gustav Hirsch, consulting engineer of the Lima Telephone and Telegraph Company, at Lima, Ohio, who has been commissioned as major in the Signal Reserve Corps, was given a farewell dinner in the private dining room of the Elks' Club by the officials of the telephone company. The dining room was attractively arranged for the occasion with a patriotic color scheme and the appointments were carried out in the same fashion.

LeRoy Parker has joined the staff of the R. L. Dollings Company, at Columbus, Ohio, in the capacity of consulting accountant. For several years Mr. Parker has been connected with the Ohio State Telephone Company, and resigned his position there only a week ago. In his new position he will have charge of the accounting and will personally investigate all companies and industries financed by the concern.

Judge J. W. Glauner, of Mt. Gilead, Ohio, was elected a director and later made president of the Morrow County Telephone Company, at the annual meeting of the stockholders of the company in Galion, Ohio. Judge Glauner succeeds V. W. Peck, who resigns because his duties as captain in the army will soon compel him to be absent from his home. W. P. Vaughan and J. C. Williamson are other local men who are directors in the company. Within a few weeks there is to be a hearing before the public utilities commission of the state relative to the proposed consolidation of the two companies now operating in Galion.

The appointment of A. B. Elias to be general manager for the Southwestern Telegraph & Telephone Company in Texas has been announced. He succeeds C. A. Gates, who is now, along with J. E. Farnsworth, a vice president. The new general manager for the telephone company in this state was formerly general plant superintendent, with headquarters in Dallas. He is succeeded in that position by W. F. Schregardus.

INCORPORATIONS.

Huntington Telephone Company, Huntington, Texas: Capital stock, $4,000; incorporators, R. P. McKewen, W. T. Stewart, J. W. Buckner and others.

Lacy Creek Telephone Company, Hazel Green, Kentucky: Capital, $225; incorporators, Frank Sample, Green Trimble and S. S. Rose.

The Gibsonburg Telephone Company, Gibsonburg, Ohio: Capital, $75,000; incorporators, A. H. Miller, N. B. Ervin, C. B. Snyder, W. J. Mead, F. W. Zorn, G. W. Hornung, F. C. Hornung.

The Waconda Telephone Company, Waconda, Wash.: Capital, $5,000; incorporator, Joseph A. Merva.

Articles of incorporation of the Gage Telephone Company of Montana have been filed with the county clerk and recorder. The company is capitalized for $15,000 and the officers are J. M. Batchelet, president; B. M. Pierce, vice-president C. F. Crothers, secretary, and E. Parker, treasurer, all residents of Gage.

The Yankee Hollow Telephone Company has incorporated under the laws of Iowa to do business at Wilton Junction in the construction and operation of rural telephones. The capital

stock of the corporation is $420, divided into shares of $30 each. Stock may be increased by a two-thirds vote of the stockholders. The officers and board of directors are as follows: Robert Harder, president; B. L. Horton, vice-president; G. W. Klein, secretary and treasurer; O. B. Collier, D. B. Collier, Bartholoma Bros., C. E. Covell, J. Nolte, Fred Boot Adm., Floyd Barclay, Mrs. C. Harder, John Mohr, Christ Jasperson and W. J. Jasperson.

Celeste Telephone Company, Celeste, Texas: Capital, $15,000, all paid in; incorporators, W. E. Braly, J. W. Ewing and A. W. Ewing.

NEWS FROM THE FIELD.

ARKANSAS.

Arkadelphia ranks high in the state in number of rural telephone lines. There are thirty-six of these lines leading out of the local exchange, averaging 15 miles in length, making about 700 miles of telephone wires into Arkadelphia. The largest of these lines has seventeen subscribers. The farmers are continually improving their lines and the number of subscribers increases each month. There are over 325 rural subscribers connected with the local exchange. In Arkadelphia there are over 450. The local exchange is under the managership of J. G. Sigler. Eight operators are employed.

CALIFORNIA.

The Pacific Telephone & Telegraph Company has applied for a franchise at Watsonville.

The Siskiyou Telephone Company, operating a telephone system partly within the Klamath National forest, Siskiyou county, has filed with the railroad commission an application for authority to acquire under a special use permit four telephone lines of the forest service, United States department of agriculture, which also operates telephone lines in the Klamath National forest for the protection and administration of it. The applicant also desires to lease three of its lines to the forest service. The application states that it is necessary to make these changes in order to facilitate the operation of two systems of telephone lines.

The Orosi Farmers' Telephone Company has reorganized and under the direction of J. W. McPherson, V. E. Sloan, F. E. Cook, G. Reynolds and C. A. Evans, about $4,000 will be spent in rebuilding the lines. Besides the lines to be constructed connection will be made with a number of private lines into new districts east of Orosi.

GEORGIA.

The new Hemlock exchange, corner Tenth street and Crescent avenue, Atlanta, will be opened on or about August 6, according to a recent announcement made by the Southern Bell Telephone Company. The new exchange will handle a large number of phones hitherto listed in the Ivy exchange and a new telephone book including all changes of numbers will be issued about the time of the opening.

IDAHO.

The Troy Rural Telephone Company has changed its name to the Troy Telephone & Electric Company.

ILLINOIS.

A joint petition was filed with the state public utilities commission by Milledgeville Mutual Telephone Company and Carroll County Independent Telephone Company, authorizing the sale by the Carroll County Telephone Company to the Milledgeville company of exchanges in Milledgeville and Chadwick.

The Chicago Telephone Company has taken title from James I. McDonald, an inspector for the company, to 96 by 121½ feet on Larrabee street, 120 feet south of Wisconsin street, which property adjoins the company's present Lincoln exchange, and was acquired for future needs at that point. Mr. McDonald obtained title to the property two weeks ago from Jacob B. Reinhart and Barbara Thexton, each conveying forty-eight feet, the prices not being disclosed.

Menard Telephone Company, Greenview; capital stock increased from $10,000 to $25,000.

The state public utilities commission ordered the reorganization committee of the Western Illinois Telephone Company and the Farmers' Telephone lines entering the city of Bushnell to continue physical connection in that city. The calls of the subscribers of the twenty-three farmers' lines connected directly or vice versa, shall be on the free basis. Calls from subscribers of the complainants in Bushnell to farmers' lines or to mutual lines a toll charge shall apply.

The annual meeting of the stockholders and directors of the Bell Telephone Company was held at the Merchants and Farmers State Bank, at Sullivan. Those from out of town were L. C. Moeszinger, L. H. Roberts, general manager, E. S. Sterrett. The residential stockholders were W. A. Steele and Local Manager Frank Witts. Everything was reported to be in first class condition.

KANSAS.

The United Telephone Company has purchased the Josephine Patterson lots on the corner west of the postoffice, at Clay Center, and will commence the erection of a telephone building at once. The building will be somewhat similar to the postoffice building, consisting of a basement and two stories. Work will be pushed as rapidly as possible, to be ready to receive the new $13,500 board that is now being built by the Kellogg Company of Chicago. The new building will be a fine improvement to the city.

The United Telephone Company, that bought the Goodland Telephone Company toll lines, has begun work putting in their new line. The Mountain States Company are working on their line from Burlington to Kanorado, where the two meet. The lines east are under construction so it won't be long until Goodland people can talk to Denver and other distant points.

Tons of copper wire and thousands of poles are being laid along the Santa Fe railway line from Great Bend to Scott City for the Bell telephone's new toll line. This line will extend from Hutchinson to Great Bend and Scott City to Pueblo, where it will connect with another new line that is being built from Denver. It is expected that the new copper line will be completed to Scott City by fall, and will afford Scott City much better long distance telephone service.

The two telephone line services of Mound township has been done away with and the Farmers' line is being controlled by the Osawatomie Telephone Company.

MICHIGAN.

A force of construction men of the Michigan State Telephone Company are building an additional toll line between the twin cities and Niles, which will greatly add to the efficiency of the service between the two points.

MINNESOTA.

Stewart Frederick has purchased the Hewitt telephone exchange from C. C. Bohn. Mr. Frederick is an old time resident of Hewitt and is well versed in the business.

The St. Mathias Rural Telephone Company has renewed its contract for exchange service with the Northwestern Telephone Exchange Company. At a special meeting of the rural company held July 7, action was taken to enter into a five-year contract for exchange service with the Northwestern. This rural line has thirty-one subscribers and operates three lines in the vicinity south of Brainerd, which is considered one of the county's most prosperous communities.

NEBRASKA.

During the conference with the railway commission, four officials of the Blair Telephone Company presented a proposition to increase the amount of stock from $10,000 to about $50,000, with the further prospect of taking over the Bell company's competing plant and borrowing money to pay for it. Attorney Clark O'Hanlon, Secretary Gossard and two directors represented the company. The stock was issued on a basis of $30 par value for each share. The company's spokesmen claimed that more money has been put in from time to time without increasing the amount of stock or raising the par value of shares. They now want permission to boost the shares to $145 each, par value, without an additional investment.

The Fairbury exchange of the Lincoln Telephone Company reports a gain of thirty subscribers since January 1, 1917. The exchange now has 1,817 subscribers, the largest of any town in the Lincoln company's territory except York, Beatrice, Hastings and Lincoln, which come in the order named.

NEVADA.

With the building of the Western Pacific into Reno a telegraph line to the district north of Reno will be established and many cities in Sierra valley that now have no telegraph service will be supplied. At present the only communication facilities with Vinton, Beckwith, Loyalton and other towns is by telephone. The building of the telegraph line will be necessary for dispatching trains in and out of Reno.

NEW MEXICO.

The Mountain States Telephone Company is planning to run new lines south of Albuquerque, the present plan to give Socorro two circuits. Manager I. Sparks states that the material is now on hand for the reconstruction and removal of the local exchange into its new quarters on Park street and Garfield avenue.

NEW YORK.

The New York Telephone Company has increased its capital from $150,000,000 to $200,000,000.

NORTH DAKOTA.

Telephone poles have been put up between Bowman and the South Dakota state line by the Bowman business men to be used by rural companies in connecting with the county seat. The

farmers of Amor have organized the Amor Telephone Company with eighteen members and as soon as the poles, wire and telephones arrive will begin work. This line will tap the trunk line into Bowman about six miles south of town. The people of Ludlow have also organized a company and will soon begin work. Later Buffalo will connect with the Ludlow line.

The Golden Valley Telephone Company has purchased the Hough Telephone Company at Baker, Montana, and A. Bradshaw of the local exchange has been placed in charge of the plant.

OHIO.

Marion County Telephone Company, at the annual meeting, elected the following board of directors: George W. King, W. G. Harding, A. J. Berry, J. G. Leffler, J. A. Schroeter, F. A. Huber, A. E. Chesney, H. B. Hane, D. R. Crissinger, F. E. Guthery, S. E. Barlow and James F. Prendergast. Directors organized by electing George W. King, president; S. E. Barlow, vice-president; Fred E. Guthery, treasurer, and A. J. Berry, secretary and general manager.

The directors of the Elyria Telephone Company authorized the expenditure of $150,000 for a $36,000 building, the installation of a $73,000 automatic telephone system and developing and extending the services.

The Keystone Telephone Company has declared a dividend of 2½ per cent on account of back dividends on the preferred stock. This leaves $26.25 back dividends.

The new exchange building planned by the Sandusky Home Telephone Company will probably be built within the next year on the Washington Row property, bought recently. The real estate forms a part of the old Mahala property and is between the Kingsbury Block and the Dilgart & Bittner furniture store. It is said the consideration was about $11,000. The property was bought from L. L. Curtis and others. There is a frontage of thirty-seven feet and the land runs back one hundred and thirty on one side and eighty on the other. Members of the company announce that Feick & Co. are working on plans for the building. If the Home company carries out its building plans the general impression is that the proposed merger of the two companies probably will not be effected, at least not for a long time.

OKLAHOMA.

The Pioneer Telephone & Telegraph Company have filed an amended charter with the state secretary, asking to change the company's name to the Southwestern Bell Telephone Company.

Construction of a new telephone line from Lawton to Fort Sill has been commenced. Five carloads of poles are already on the ground and a large force of workmen are here ready to commence the work.

OREGON.

The way was cleared for the reorganization and further expansion of the Home Telephone Company of Portland when Federal Judge Wolverton granted an application for receivership. The action is friendly, and is a technical step necessary to put the company on a financially sound basis.

UTAH.

The Uinta Telephone Company filed an amendment to its articles of incorporation with the secretary of state, increasing its capitalization to $45,000. The par value of the stock is $10.

WASHINGTON.

The Pioneer Telephone Company, a volunteer association, has petitioned the county commissioners of Stevens county, Washington, for a franchise to use a portion of the Joe Martin road for the construction and maintenance of a telephone line.

WISCONSIN.

Telephone service between Athelstane and the outside world is soon to be restored. The line between that town and Amberg which is a part of the system of the Amberg Telephone Company, has been discontinued for several weeks, owing to a part of the old road between those towns having been closed and the poles removed from the farms which the line crossed. Poles will have to be set and wires strung along a stretch of about a mile and a half of the new highway before service can be resumed, but this work is now well under way.

Representatives from about fifteen telephone companies met at Marshfield at the Elks' clu house in annual session. A number of topics were discussed of interest to telephone men, and the following officers elected for the ensuing year: The new officers are: Dr. H. H. Christofferson, Colby, president; N. M. Berg, Auburndale, first vice-president; Mr. Clark, Thorp, second vice-president; Charles Ingle, Granton, third vice-president; L. Smith, Neillsville, secretary.

Prizes for Exchange Names

To two employes of *The Tulsa World* goes the honor of selecting the official name to be adopted as a prefix to numbers on the present exchange of the Pioneer Telephone Company when the company's second exchange is inaugurated in the near future, at Tulsa, Okla.

A. C. Mitchell, staff artist, and E. Salomon of *The World's* advertising department, each "in the dark" as to the title submitted by the other, entered the name "Osage" and yesterday were announced as the joint winners of a $10 prize offered by the telephone company. The second exchange soon to be placed in operation will be known as "Cedar," the selection of that name having won a prize of $10 for Mrs. Max Madansky, 417 South Houston street.

Hundreds of names were submitted in the contest launched by the Pioneer company several weeks ago, and numerous rival contestants entered the winning name, but at too late a date to be in line for first prizes. Aside from the $10 prizes, one of which was divided evenly between Messrs. Mitchell and Solomon, prizes of one dollar each were awarded to Mrs. Grace Renfro, 1743 South Baltimore avenue; Miss Margaret Branch, 1140 South Boston avenue, and Mrs. K. D. Brown, 622 West Third street, who also submitted the name "Osage." Prizes of one dollar each also were awarded to Robert E. Bennett, 616 West Seventh street, and Edward House, an employe of the Livingston Oil corporation, for having been entrants of the title "Cedar."

Competitive names were entered ranging from "Oil" to "Petroleum" and including such other suggestions as "Cosden," "Sinclair," "Kerosene," "Gas," "Irving," "Pioneer," "Boston," "Market," "East," "West," "North" and "South." A contestant in Kendall, apparently with some sense of humor, suggested "Kendall" and "Podunk."

"The name 'Osage' was adopted for the present plant," George J. Bell, Tulsa manager for the Pioneer, said, "in respect to the so-called Osage country which is in such close proximity to Tulsa. Osage county embraces a portion of the city, and the Osage Nation and Osage Indians for years were familiar names on the city's present site before the name Tulsa was coined or the community founded.

"In addition to its local historical significance 'Osage' is a name pleasing to the ear. It can easily be understood by operators and pronounced distinctly by telephone patrons. This also was true of the word 'Cedar.' We did not want such names as 'Maple' or 'Walnut,' not because of their relation to the names of trees, but because Oklahoma City and numerous other towns have such familiar prefix names for individual exchanges. The presence of such an abundance of cedar trees in the forest regions surrounding Tulsa also entered into the merits of the name."

Selection of the winning names was made by a committee headed by H. G. Smith, supervisor of directors for the Pioneer company, with headquarters at Oklahoma City.

The creation of a second telephone exchange in Tulsa is made necessary by the rapid growth of that utility here. The company at present is not able to render the desired service to its patrons and cannot, with the present equipment, accommodate hundreds of would-be telephone customers who seek service. Construction work on the new exchange, which will be housed in the Pioneer's five-story office building at the corner of Boston and Fourth, now is under way